

THE PSYCHOLOGICAL BULLETIN

PROCEEDINGS OF THE THIRTY-FOURTH ANNUAL
MEETING OF THE AMERICAN PSYCHOLOGICAL
ASSOCIATION, INCORPORATED, ITHACA, NEW
YORK, DECEMBER 28, 29, 30, 1925.

REPORT OF THE RETIRING SECRETARY, JOHN E. ANDERSON,
UNIVERSITY OF MINNESOTA

The American Psychological Association, Incorporated, held its Thirty-Fourth Annual Meeting at Cornell University, Ithaca, N. Y., on Monday, Tuesday, and Wednesday, December 28, 29, and 30, 1925. Two hundred and four persons registered, the largest number in attendance in the history of the Association at a meeting not held in affiliation with the A.A.A.S.

The program consisted of ten formal sessions at which fifty papers were presented by members of the Association, a session at which fifteen papers were presented by graduate students, the Annual Dinner followed by the Presidential Address, and five round table Conferences. Exclusive of the informal reports by graduate students, the fifty papers were classified by the Program Committee, somewhat arbitrarily to be sure, as follows: general psychology, twelve; experimental psychology, thirteen; applied psychology, six; clinical psychology, five; abnormal psychology, four; mental measurement, five, and educational psychology, five.

The Annual Dinner was held on Tuesday evening. President Livingston Farrand of Cornell welcomed the Association to Cornell with reminiscences of the early days of the Association. The title of the Presidential Address given by Madison Bentley was "The Major Categories of Psychology."

Two round table conferences were held on Experimental Psychology, one was held on Clinical Psychology, one on Psychological Consultation for College Students, and one on the Measurement of Character and Personality Traits. All were well attended.

Apparatus was exhibited by a number of members and by the C. H. Stoelting Company.

TRANSACTIONS OF THE ANNUAL BUSINESS MEETING

Due notice having been given, the annual business meeting of the American Psychological Association, Inc., was held on December 28, 1925, in the Recreation Room of Prudence Risley Hall, Cornell University, Ithaca, New York, at 8 o'clock, with President Madison Bentley in the chair.

Upon motion duly made and seconded, it was voted that the minutes of the Thirty-third Annual Meeting at Washington, D. C., be approved as printed.

The Secretary read an invitation from the Sixth International Congress of Philosophy to be held at Cambridge, Massachusetts, September 13-17, 1926; an announcement concerning research fellowships in the Social Sciences from the Social Science Research Council; and an invitation for the Association to be represented for the Third Pan-Pacific Science Congress at Tokyo, Japan, October 27-29, 1926.

The Secretary announced the deaths of G. S. Fullerton, March 23, 1925, age sixty-six, and James C. Chapman, July 15, 1925, age thirty-five. The Secretary announced the resignations during the year 1925 of G. C. Bassett, Norbert J. Melville, W. S. Monroe, W. H. Pyle, and Ellen B. Talbot.

The Treasurer's report as printed on page 123 was read and approved by vote of the Association.

The Treasurer presented an estimate of resources for 1926 as printed on page 124.

The Secretary then presented a brief report on the incorporation of the Association, summarizing the acts of the Association which preceded the incorporation and the procedure through which incorporation was completed.

Upon the recommendation of the Council of Directors, it was unanimously voted that the Association express to Mr. Wm. M. Marston its sincere appreciation of the legal assistance he rendered

the Association in connection with the incorporation of the Association and the transfer of the Psychological Review Company.

On recommendation of the Council of Directors, it was unanimously voted to amend Section 2 of Article VI of the By-laws by the addition in the first sentence, after the words "National Research Council," the words "and for representatives of the Association on the Social Science Research Council," and in the last sentence of that Section, the addition of the words "and to the Social Science Research Council" after the words "National Research Council."

On recommendation of the Council of Directors, it was unanimously voted to amend Section 1 of Article VIII of the By-laws by substituting the word "seven" for the word "ten" in the first sentence, and the word "three" for the word "six" in that sentence.

On the recommendation of the Council of Directors, it was voted to adopt the following resolution:

"Provided financial assistance can be obtained toward the editorial expenses of the Abstract Journal for a period of years, the Association will undertake to develop an adequate abstract journal covering the field of Psychology and will attempt further to make the Journal self-supporting by the end of ten years. The Association does not wish, however, to obligate itself in any way to continue the enterprise beyond this period if experience should show that it cannot be made to support itself financially."

On the recommendation of the Council of Directors, it was voted to appoint a committee of three members, W. S. Hunter, Chairman, S. W. Fernberger, and H. S. Langfeld, to proceed with the formulation of plans for seeking a subvention for the Abstract Journal, and to draw up a detailed budget to be presented through the proper channels, and further, to appropriate and authorize the Treasurer, upon presentation of vouchers, to pay the sum of \$300.00, or as much thereof as may be necessary, for the expenses of the Committee.

On the recommendation of the Council of Directors, it was voted to empower and authorize the Council of Directors of the Association to accept such a subvention through the proper fiscal agents.

On the recommendation of the Council of Directors, it was voted to ratify the action of the Council in postponing the commencement of the Abstract Journal from January 1, 1926, to January 1, 1927.

On the recommendation of the Council of Directors, it was voted that after January 1, 1927, the practice of publishing abstracts in the Psychological Bulletin be discontinued.

On the recommendation of the Council of Directors, it was unanimously voted that the matter of the continuation of editors for any of the Journals owned by the Association be left to the Council of Directors, and that the appointment by the Council of Directors of any new editor to any Journal shall receive the approval of the Association.

On the recommendation of the Council of Directors, it was voted to recommend to the Association that the present editors of the Review publications be continued except that John B. Watson be invited to act as editor of the Psychological Review during Professor Warren's absence abroad, and that Madison Bentley be invited to edit the Journal of Experimental Psychology and that Walter S. Hunter be invited to edit the Psychological Index.

The Secretary then presented the letter printed below from Dr. Morton Prince offering to give to the Association the Journal of Abnormal and Social Psychology. With the letter there was submitted a financial statement of the affairs of the Journal, which is on file in the Secretary's office.

Nov. 9, 1925.

My dear Dr. Anderson:

In accordance with the conversation between yourself, Dr. Edwin G. Boring, and myself, last winter, of which you have a memorandum, I take pleasure in offering as a free gift to the American Psychological Association the Journal of Abnormal Psychology (to which I have legal title).

I am prompted to make this donation by a desire to provide for the Journal after my death in a way that will insure its being continued as a high grade, scientific journal, and not the organ of any special "school." This, I feel, would be insured by its being owned and published by the Association.

The only condition that I would make in donating the Journal, and if it be accepted by the Association, is that any profit that may accrue after paying all legitimate expenses shall be used solely for the benefit of the Journal and its subscribers and shall not be used for any other purpose, such as the support of another journal or undertakings of the Association not connected with the editing and publishing of the Journal of Abnormal and Social Psychology.

As to whether the Association will undertake the administrative work of publishing the Journal or will have it published as at present by some publishing house, that would be a matter for the Association to determine, and I leave the Association perfectly free to do as it pleases. This matter is referred to in the memorandum of our conversation. As a mere matter of opinion based on a good many years of experience with publishers, I am convinced that the better way would be for the Association to undertake the publishing end.

It would give me considerable pleasure and satisfaction to continue in my present capacity as Editor of the Journal, so long as Time, the arbiter of all things, and the Association do not consider that a change should be made. Of course, if the Association should accept this gift it would be free to appoint the members of the editorial staff. You will remember that in view of the possibility of the Association taking over the Journal, the present coöperating editor was unofficially nominated by the Council of the Association at my request.

I enclose a brief financial statement of the Journal's condition, as you request.

Yours sincerely,

MORTON PRINCE.

P. S.—There are two other matters that I have neglected to mention.

1. The Journal was founded in the interests of Abnormal Psychology. I should be very sorry, therefore, if the purview of the Journal were so changed that this field of psychology would be dropped or so modified or minimized that Abnormal Psychology would be subordinated to some other field. It is my wish that the Journal be continued, so long as is practical, as one devoted primarily to Abnormal Psychology. As, however, it is impossible to forecast the future, I do not make this a condition, having entire confidence that the Association will continue the policy of the Journal so long as it seems justified.

2. I hope that Dr. Henry T. Moore may be continued on the Editorial Staff in his present position. This would seem to be required by good faith, as he only recently accepted the position under conditions above referred to.

M. P.

On the recommendation of the Council of Directors, the Association, by a rising vote, expressed its appreciation of the generous offer made by Dr. Prince, and instructed the Secretary to convey to Dr. Prince a vote of thanks.

On the recommendation of the Council of Directors, it was voted that the Association accept the proposal of Dr. Prince and that a committee of three be appointed by the incoming President to confer with Dr. Prince on the deed of gift in the spirit of discussion with and the letter sent by Dr. Prince, and that the Council of Directors be empowered to accept the gift when made.

On the recommendation of the Council of Directors, it was voted that the Journal be administered by a committee of the Association to consist of the Editor of the Journal of Abnormal Psychology, the Treasurer of the Association, and the Business Manager of the Psychological Review Company.

On the recommendation of the Council of Directors, it was voted that the Association invite Morton Prince to continue as Editor of the *Journal of Abnormal and Social Psychology* and that the Association invite Henry T. Moore to continue as Associate Editor.

On the recommendation of the Council of Directors, it was voted that Samuel W. Fernberger be elected Secretary of the Association for the term 1926-28.

On the recommendation of the Council of Directors, it was voted that the resignation of Samuel W. Fernberger as a Director be accepted to take effect immediately.

On the recommendation of the Council of Directors, it was voted that the individual receiving the third highest number of votes in the election for Directors be elected a Director for the unexpired portion of Mr. Fernberger's term.

The Treasurer then presented the budget of the Association for the year 1926, as printed on page 124. On the recommendation of the Council of Directors, it was voted that the Association approve the budget as presented by the Treasurer and authorize payments thereunder.

The Secretary then presented a brief history of the transfer of the Psychological Review Company to the American Psychological Association, describing the details of organization of that company in its relation to the Council of Directors and to the American Psychological Association.

Mr. Langfeld, as Business Manager of the Psychological Review Company, then presented a report of the affairs of the company. On the recommendation of the Council of Directors, it was voted that the report of the Business Manager of the Psychological Review Company be accepted and placed on file with the Secretary so that Members may consult it.

On the recommendation of the Council of Directors, Messrs. Edwin G. Boring and John E. Anderson were elected to represent the Association on the Council of the American Association for the Advancement of Science for the year 1926.

On the recommendation of the Council of Directors, it was voted that the invitation of the University of Pennsylvania to hold the 1926 meeting in Philadelphia be accepted, and that the meetings be held December 28th, 29th, and 30th, and that Karl G. Miller be the local representative of the Association.

On the recommendation of the Council of Directors, it was voted

that the 1926 Council of the Association be urged to accept the invitation of Ohio State University to hold the 1927 meeting at Columbus, Ohio.

On the recommendation of the Council of Directors, it was voted that the following Program Committee be elected for the year 1926: Knight Dunlap, Arthur I. Gates, and the Secretary.

On the recommendation of the Council of Directors, it was voted to elect the twenty-eight persons named below as Members of the Association.

1. Allport, Gordon W., Ph.D., 1922, Harvard, Instructor in Psychology, Harvard University.
2. Bates, Robert Lee, Ph.D., 1924, Johns Hopkins, Assistant Professor of Psychology, Virginia Military Institute.
3. Benson, Charles Emile, Ph.D., 1922, Columbia, Associate Professor Educational Psychology, New York University.
4. Bishop, Margaret Kincaid, Ph.D., 1922, Minnesota, Instructor in Psychology, Smith College.
5. Blatz, William E., Ph.D., 1924, Chicago, Assistant Professor of Psychology, University of Toronto.
6. Burr, Emily Thorpe, Ph.D., 1922, Columbia, Psychologist, Vocational Adjustment Bureau, New York City.
7. Ellis, Robert Sidney, Ph.D., 1914, Clark, Associate Professor of Psychology, Syracuse University.
8. Filter, Raymond O., Ph.D., 1921, Illinois, Assistant Professor of Psychology, University of Pittsburgh.
9. Guthrie, Edwin Ray, Ph.D., 1912, Pennsylvania, Assistant Professor of Psychology, University of Washington.
10. Heron, William Thomas, Ph.D., 1924, Chicago, Assistant Professor of Psychology, University of Kansas.
11. Herring, John Peabody, Ph.D., 1924, Columbia, Director, Bureau of Research, Trenton, N. J.
12. Holsopple, James Q., Ph.D., 1924, Johns Hopkins, Instructor in Psychology, Yale University.
13. Hurloch, Elizabeth, Ph.D., 1924, Columbia, Instructor of Psychology, Columbia University.
14. Klüver, Heinrich, Ph.D., 1924, Leland Stanford, Instructor of Psychology, University of Minnesota.
15. Landis, Carney, Ph.D., 1924, Minnesota, N.R.C. Fellow in the Biological Sciences, University of Minnesota.
16. McClatchy, Vivienne R., Ph.D., 1924, Chicago, Associate Professor of Psychology, Florida State College for Women.
17. Nixon, Howard K., Ph.D., 1924, Columbia, Instructor in Psychology, Columbia University.

18. Richmond, Winifred V., Ph.D., 1919, Clark, Psychologist, St. Elizabeths Hospital, Washington, D. C.
19. Sanborn, Herbert C., Ph.D., 1908, Munich, Professor of Psychology, Vanderbilt University.
20. Shellow, Sadie Myers, Ph.D., 1923, Columbia, Psychologist, Milwaukee Electric Light and Railway Company, Milwaukee.
21. Sherman, Irene Case, Ph.D., 1924, Chicago, Children's Memorial Hospital, Chicago, Illinois.
22. Skaggs, Ernest Burton, Ph.D., 1923, Michigan, Instructor in Psychology, University of Michigan.
23. Skinner, Charles E., Ph.D., 1923, New York, Professor of Education, Miami University.
24. Teagarden, Florence M., Ph.D., 1924, Columbia, Assistant Professor of Education, University of Pittsburgh.
25. Todd, John Welhoff, Ph.D., 1912, Columbia, Professor of Psychology, University of Southern California.
26. Travis, Lee Edward, Ph.D., 1924, Iowa, N.R.C. Fellow, University of Iowa.
27. Wechsler, David, Ph.D., 1925, Columbia, Consulting Psychologist, Associate of Psychological Corporation, New York City.
28. Yates, Dorothy, Ph.D., 1921, California, Assistant Professor of Psychology, State Teachers College, San Jose, California.

On the recommendation of the Council of Directors, it was voted that the forty-five persons whose names were presented by the Council for election as Associates, be elected as Associates.

It was moved and seconded that the names of Associates-elect be not printed in the Proceedings of this meeting. It was moved and seconded that this motion be amended by the addition of the words "Members-elect." The amendment was lost by a vote of 12 for and 40 against. The original motion was then passed.

Upon motion duly made and seconded, it was unanimously voted that the word "three" in the last sentence of Section 7 of Article I of the By-laws be changed to the word "two," thus requiring Members-elect and Associates-elect to give notice of acceptance within a period of two months.

The report of the Committee on the Election of Officers was then presented as follows:

President for 1926: Harvey A. Carr, University of Chicago.
Directors, 1926-28: John E. Anderson, University of Minnesota,
and K. S. Lashley, University of Minnesota.
Director, 1926-27, to fill unexpired term of S. W. Fernberger:
Arthur I. Gates, Columbia University.

Nominees for appointment to the Division of Anthropology and Psychology of the National Research Council: Madison Bentley, University of Illinois, and W. S. Hunter, Clark University.

Representatives on the Social Science Research Council: R. S. Woodworth, Columbia University; F. H. Allport, Syracuse University, and R. M. Yerkes, Yale University.

On the recommendation of the Council of Directors, it was voted that R. S. Woodworth be elected as representative on the Social Science Research Council for the term 1926-1928; that F. H. Allport be elected representative for the term 1926-1927, and that R. M. Yerkes be elected representative for the term 1926.

The report of the Committee on the Certification of Consulting Psychologists was then read by the Secretary with a recommendation from the Council that the report of the committee be accepted and placed on file by the Secretary as a source of information in questions arising concerning consulting psychologists.

In the discussion of the recommendation of the Council, the question was raised whether by placing the report on file the Council intended not to publish the report. The reply was given that it was the sense of the Council's recommendation that the report be not printed.

A motion was made and seconded that the report be privately printed and distributed to members. The motion was lost.

Upon motion duly made and seconded, it was voted that the recommendation of the Council be adopted.

The following report from the Committee on the Relation of Psychology to the Public Welfare was presented:

"The Standing Committee on the Relation of Psychology to Public Welfare reports that no matters have been brought to its attention during the current year. Recommendation is made that the Committee be discharged.

"The Committee recommends further that matters relating to public welfare be specifically referred to special committees at the time of the annual meeting or by the Executive Committee as occasion may arise."

On the recommendation of the Council, it was voted that the report of the Committee be accepted and that the Committee be discharged with the thanks of the Association.

On the recommendation of the Council, it was voted that the Committee on an "Associate" Grade of Membership, which through

oversight had not been discharged at the last annual meeting, be discharged with the thanks of the Association.

The report of the Committee on Precautions in Animal Experimentation as printed on page 124 was then presented.

Upon motion duly made and seconded, it was voted that the report of the Committee be adopted, that the report be printed in the Proceedings, and that the Committee be continued.

Upon motion duly made and seconded, it was voted that the incoming President appoint a Committee of two to coöperate with a similar committee of the National Research Council in the consideration of the feasibility or means of publishing a series of Psychological Handbooks.

Mr. R. S. Woodworth then presented an informal report on the activities of the Social Science Research Council.

Upon motion duly made and seconded, it was voted to thank Cornell University for its generous hospitality and the many courtesies extended during the meetings and to thank Professor Weld and the local committee for the excellent manner in which all arrangements have been carried out.

The meeting adjourned at 10:15 P.M.

JOHN E. ANDERSON,

Secretary.

NOTE: The incoming President made the following committee appointments: Committee on Certification of Consulting Psychologists, W. F. Dearborn, for the term 1926-30; Committee to Arrange for Transfer of Journal of Abnormal and Social Psychology; E. G. Boring, Chairman, W. M. Marston, and John E. Anderson; Committee on an American Handbook of Psychology, E. S. Robinson, Chairman, and S. W. Fernberger. The following committee of the Council of Directors to consider the relationship between nominations for Associateship and nominations for Membership was appointed by the incoming President: John E. Anderson, Chairman, R. Pinter, and E. S. Robinson.

REPORT OF THE TREASURER FOR THE YEAR 1925

Dr.

To Balance from the previous year.....	\$1,497.92
Dues received from members.....	2,351.20
Interest.	15.29
	<hr/>
	\$3,864.41

Cr.

By Printing and Supplies.....	141.37
Postage.	107.03
Reprints.	79.43
Year Book	258.11
Abstracts.	292.97
Incidentals of 1924 meetings.....	57.27
Apparatus Exhibit	20.70
Library Check List Committee.....	8.94
Expenses of incorporation.....	25.12
Transfer of Psychological Review Publications..	26.68
Moving Secretary's office.....	34.56
Treasurer's bond	10.50
First payment on Psychological Review Publications.	500.00
Exchange.	15.95
Secretary's stipend	750.00
Treasurer's stipend	100.00
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	2,428.63
Cash on hand by balance in Illinois Merchants Trust Company..	1,435.78
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	\$3,864.41

ACCOUNT OF CERTIFICATION COMMITTEE

Dr.

To Balance from the previous year.....	\$442.46
Interest.	9.98
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	\$452.44

CHICAGO, ILLINOIS
December 15, 1925

Respectfully submitted
EDWARD S. ROBINSON
Treasurer

Audited and found correct
December 27, 1925
SAMUEL W. FERNBERGER
L. L. THURSTONE

ESTIMATE OF RESOURCES FOR 1926

Dues from Members:	
500 at \$7.00.....	\$3,500.00
Dues from Associates:	
30 at \$3.00.....	90.00
Interest.	15.00
	<hr/> \$3,605.00

BUDGET FOR 1926

Printing and supplies.....	\$200.00
Postage.	125.00
Reprints.	100.00
Year Book	260.00
Abstracts.	300.00
Incidentals 1925 meeting.....	75.00
Apparatus Exhibit	50.00
Incidental expenses in connection with Psychological Review Publications	100.00
Treasurer's bond	10.50
Second payment on Review Publications.....	500.00
Travel expenses, Committee on Abstract Journal....	300.00
Interest on notes.....	170.00
Exchange.	20.00
Secretary's stipend	750.00
Treasurer's stipend	100.00
	<hr/> \$3,050.50

REPORT OF COMMITTEE ON PRECAUTIONS IN ANIMAL EXPERIMENTATION, 1925

Your Committee appointed "to consider precautions to be taken in animal experimentation and to submit recommendations to the Association at its meeting in Ithaca, 1925," having acquainted itself with prevalent laboratory practices in animal experimentation, with the restrictional efforts of anti-vivisectionists, and with varied evidences of need for educational and protective work by individuals and organizations whose research demands animal experimentation, begs to offer the following recommendations:

1. That the Code of Self-regulation adopted by medical research laboratories of the United States, copy of which is appended, be accepted by the American Psychological Association, and that the Association recommend and request that a copy of said Code, modified if necessary to meet the requirements of the particular institution, be conspicuously posted in every psychological laboratory where experiments with animals are conducted.

CODE OF ANIMAL EXPERIMENTATION

"I. Vagrant dogs and cats brought to this Laboratory and purchased here shall be held at least as long as at the city pound, and shall be returned to their owners if claimed and identified.

"II. Animals in the Laboratory shall receive every consideration for their bodily comfort; they shall be kindly treated, properly fed, and their surroundings kept in the best possible sanitary condition.

"III. No operations on animals shall be made except with the sanction of the Director of the Laboratory, who holds himself responsible for the importance of the problems studied and for the propriety of the procedures used in the solution of these problems.

"IV. In any operation likely to cause greater discomfort than that attending anesthetization, the animal shall first be rendered incapable of perceiving pain and shall be maintained in that condition until the operation is ended.

"Exceptions to this rule will be made by the Director alone and then only when anesthesia would defeat the object of the experiment. In such cases an anesthetic shall be used so far as possible and may be discontinued only so long as is absolutely essential for the necessary observations.

"V. At the conclusion of the experiment the animal shall be killed painlessly.

"Exceptions to this rule will be made only when continuance of the animal's life is necessary to determine the result of the experiment. In that case, the same aseptic precautions shall be observed during the operation and so far as possible the same care shall be taken to minimize discomforts during the convalescence as in a hospital for human beings."

2. That the policy of an "open door" be approved by the American Psychological Association and recommended to the directors of such psychological laboratories as engage in animal experimentation. This policy shall be interpreted to mean that any accredited member or responsible official of a humane society shall, by arrangements with its director, at any time be permitted to visit a laboratory to observe the care of animals and methods of experimentation.

3. That the American Psychological Association endeavor to enlist the coöperation of psychological journals in the defense and protection of animal experimentation and that it especially request them (a) to note and require that manuscripts which describe experiments with animals contain explicit statements about the measures taken to avoid needless pain or discomfort, and (b) to decline to publish manuscripts descriptive of experiments which violate the code of animal experimentation adopted by the Association.

4. That classroom instruction and publicity on the part of psychologists concerning the nature, requirements, and values of animal experimentation be encouraged and facilitated.

5. That the American Psychological Association maintain a standing committee on "precautions in animal experimentation." Important among the duties of this committee shall be (a) the establishment and maintenance of coöperative relations with such organizations, vitally interested in safe-

guarding animal experimentation, as the Committee on Protection of Medical Research of the American Medical Association, the American Public Health Association, and the American Association for Medical Progress, and (b) suitable endeavor with them to disseminate accurate information about animal experimentation and to combat attempts to prevent or restrict it.

Submitted by

EDWARD C. TOLMAN

PAUL T. YOUNG

ROBERT M. YERKES, *Chairman*

LIST OF PAPERS

(Arranged alphabetically by Authors)

1. E. Bagby, The Nature of Motivated Behavior as Indicated by an Analysis of a Case of Compulsive Hand-Biting.
2. E. L. Baker, A Case Study of Discrepancies Between Mental Ability and Achievement Through Four Years of College.
3. T. L. Bayne, Further Data on Conditioning Emotional Reactions.
4. C. H. Bean, Job-Analyzing Athletics.
5. Madison Bentley, The Major Categories of Psychology.
6. A. G. Bills, The Influence of Muscular Tension on the Efficiency of Mental Work.
7. H. C. Bingham, Standardization of Methods for Studying Anthropoid Behavior.
8. W. V. Bingham, Personality and Dominant Interest: Vocational Tendencies of Introverts.
9. Phyllis Blanchard, A Study of Subject-Matter and Motivation of Children's Dreams.
10. Ruth Burke, The Measurement of Sociability.
11. H. Cason, An Experimental Study of Backward Association.
12. C. W. Darrow, Sensory, Secretory and Electrical Changes in the Skin During Bodily Excitation.
13. J. F. Dashiell, A Study of Direction-Sense in Animals.
14. F. L. Dimmick, The Positive After-Image of Twilight Vision.
15. R. Dodge, The Refractory Phase Hypothesis of the Nature of Inhibition.
16. K. Dunlap, The Effect of Rate of Retardation on Post-Rotation Nystagmus.
17. A. S. Edwards, Intelligence and General Psychology.
18. C. E. Ferree, The Effect of Mixing Artificial Light with Daylight on Important Functions of the Eye.
19. M. Freyd, How Should Psychology Be Applied?
20. R. H. Gault, Controls Employed in Relation to Experiments in the Identification of Speech Sounds by Tactile Criteria.
21. L. R. Geissler, Form Perception in Indirect Vision.
22. A. Gesell, A Standard Observation Pen for the Study of Infant Behavior.

23. J. A. Glaze, Psychological Studies of Fasting.
24. Josephine Gleason, Some Organic Aspects of Emotion.
25. C. R. Griffith, Psychological Research in Athletics.
26. H. Helson, The Regeneration of Cutaneous Nerve.
27. L. B. Hoisington, The Mental Matrix and the Formation of Patterns.
28. H. M. Johnson, An Essay Toward an Adequate Explanation of Sleep.
29. Grace H. Kent, A Performance Test Outfit for the Traveling Clinic.
30. H. D. Kitson, Labor Turnover Among Psychologists.
31. L. W. Kline, Transfer and Inhibition in Learning Right and Left Stylus Mazes.
32. P. J. Kruse, The Relation of Rate to Quality of Work.
33. Christine Ladd Franklin, The Blue Arcs and the Blue Glow of the Retina.
34. Zoe Leatherman, A Survey of Personnel Blanks in Use in Colleges of the United States.
35. G. W. A. Luckey, Psychology and an International Education Research Council and World Bureau of Education.
36. F. H. Lund, The Criteria of Confidence.
37. D. I. Macht, The Effect of Menotoxin Injections on the Behavior of Rats in the Circular Maze.
38. Florence Mateer, Calcium Deficiency as a Factor in Mental Instability.
39. M. A. May, The Predictability of Human Behavior.
40. J. A. McGeoch, Three Measures of Report Ability and Their Correlation with Intelligence.
41. W. C. Olsen, Technique for Determining Undesirable Behavior in School Children.
42. R. H. Paynter, Jr., Educational Achievement of Children with Personality and Behavior Difficulties.
43. J. Peterson, Local Signs as Orientation Tendencies.
44. W. B. Pillsbury, Gestalt vs. Concept as a Principle of Explanation.
45. R. Pintner, The Scoring of Group Intelligence Tests.
46. C. C. Pratt, The Relation of Speed to Intelligence.
47. S. L. Pressey, Three Simple Experiments in the Teaching of Required Classes in Psychology.
48. E. S. Robinson, Principles of the Work Decrement.
49. C. Rosenow, An Explanation of the Acceptance of Suggestions During Hypnosis and of the Amnesia Which Follows It.
50. C. A. Ruckmick, The Development of Laboratory Equipment in the United States.
51. H. Rugg, The Intellect of Races.
52. W. H. Sheldon, Correlation of Physical, Mental, and Social Traits.
53. C. P. Stone, Sexual Behavior of Male Rabbit After Destruction of Large Areas of the Cerebral Cortex.
54. G. M. Stratton, An Informal Communication from the Division of Anthropology and Psychology of the National Research Council.
55. G. M. Stratton, Emotion and the Incidence of Disease.
56. P. M. Symonds, Study Habits of High School Pupils as Shown by Close Observation of Contrasted Groups.

57. L. L. Thurstone, The Mental Growth Curve and Adult Intelligence.
58. M. S. Viteles, Evaluation of Criteria in Vocational Selection.
59. Margaret F. Washburn, Gestalt Psychology and Motor Psychology.
60. A. P. Weiss, The Postulational Principle in Psychology.
61. F. L. Wells, The General Personality and Certain Features of the Sex Life with Special Reference to Instruction.
62. R. H. Wheeler, Affection from the Standpoint of Complete Introspection.
63. P. L. Whitely, The Dependence of Learning and Recall upon Prior Mental Activities.
64. G. E. Wiegand, A Comparison and Calibration of Tests of Psychological Impairment, Produced by Narcotics and by Fatigue.
65. O. Williams, A Study of Reminiscence and Obliviscence.
66. P. T. Young, The Logic of Affective Psychology.

ABSTRACTS

MONDAY, DECEMBER 28, 9:30 A.M.

PROGRAM A

GENERAL PSYCHOLOGY

An Informal Communication from the Division of Anthropology and Psychology of the National Research Council. By the Chairman of the Division, G. M. STRATTON.

An unusually close connection exists between the American Psychological Association and the Division of Anthropology and Psychology of the National Research Council. The majority of psychologists in the division—six of the nine, to be precise—are elected to their places there by this association and as its official and formal representatives. And the few who are not so elected, but are chosen by the division itself, are commonly members of this association. The division is thus in fact almost a special agent of the association, and should return, from time to time and not infrequently, to its principal for conference and coöperation. It would be unfortunate if the division should ever feel that it could live and act without the full confidence and counsel of the larger body; or if the association should believe that it could cease to keep a living interest in the decisions of its representatives,—indeed a responsibility for those decisions.

The conception which the division has of its office should be explained for criticism and advice; and there should be an understanding also of the division's relation to the National Research Council, together with the special conditions under which all projects must be planned and realized. The facilities and limitations of the division's action must be known if the association is usefully to advise and appraise what is done and what is attempted.

The division would wish to be sure that it is making full use of its opportunities, especially those which come from its connection with this association. Perhaps steps might be taken by the association itself to advise the division, regularly and often, how the interests of psychology might be advanced. Various ways might be considered

whereby the association might upon occasion call forth the thought of its membership and of its special groups, and, after sifting and weighing, transmit to the division whatever the association felt would be of greatest use.

The Mental Matrix and the Formation of Patterns. L. B. HOISINGTON, Cornell University.

This study, in line with some others that have appeared recently, seeks a more adequate knowledge of mind in its simpler forms; not, necessarily, in terms of attributes but in terms of experience itself. What, phenomenologically, if you will (only the word is inappropriate) lies beyond perception and how do we come to true phenomenology and perception are the questions raised and partly answered.

The first difficulty is that of instruction, since you ask for and the subject must make a report in perceptive terms on what by hypothesis is nonperceptive. The difficulty, though seemingly absolute is not so, but it makes a clean exposition out of the question.

There is a precategorical state of bare experience, sheer being, that is homogeneous; that is not experienced as belonging to the subject; that lends itself inadequately to classificatory description. This mental matrix, our reports reveal, is, when put into categorical terms, like a pressury gray extension that is somehow lively. These three are not in any way differentiated one from the other; they constitute an existence, a being.

From this we pass by way of a "gap," a "break," a "snap" to the differentiated, the heterogeneous, that carries, usually, in addition to modality a more or less specific quality; that shows progression within itself; that has a "here" and a "there" both relatively and absolutely; that displays a foreground and a background, the more and the less dense portions, the clear outstanding and the obscure that in ordinary experience escapes notice or becomes mass and tissue of the concretized part. Thus we have formed a pattern; a redistribution with relative values admitted. We may now speak of greater and less, of this or that quality: experience has become perceptualized in that the categories of classification are now available.

The adequate description of such a part of an experience as means its own concretized self gives us phenomenology in its pure form. With the advent and the development of object meaning the experience becomes more and more limited for observation but the transition is gradual. When carried a step further we get, in

the shift from vortex to vortex, a hint of the eventual laws of the constitution of mind.

Gestalt Psychology and Motor Psychology. MARGARET FLOY WASHBURN, Vassar College.

Gestalt psychology attacks "associational" psychology on the ground that the latter regards conscious experience as composed of simple parts united by the laws of association, and that introspection does not confirm this view. But motor psychology is immune from this attack. While its physiological basis is the coöperation of simple nervous units, it regards the *experience* of a whole composed of parts as occurring only when and if the parts set up different motor responses; and this happens only when and if such differences of motor reaction are practically important.

For motor psychology, on the receptor side a sensori-motor phenomenon is usually complex. On the effector side it may be either relatively simple or relatively complex. The conscious experience is simple when the situation is reacted to as a whole; complex when parts of the stimulus are reacted to separately. The reactions may be full movements or incipient, tentative movements. Whether incipient or full, the reactions cause proprioceptive or kinaesthetic excitations. These may in their turn be reacted to: when they are reacted to as a whole, the resulting conscious experience is a simple feeling of relation; when they are reacted to separately and thus localized in the body, it is a complex of kinaesthetic sensations. Since analysis of such excitations has seldom been useful, their kinaesthetic, localized character is not often realized. In every conscious experience there is a kinaesthetic factor as well as one ultimately of exteroceptive origin.

The phenomena of perception quoted by Koffka and Köhler is impossible to explain by any hypothesis other than that of configurationism may be explained by the motor psychology above outlined; for example, the relations of ground and figure (assimilation and emphasis), and the variety of experiences obtainable in discrimination experiments, including Köhler's observation that an animal may react on the basis of the same training either positively or negatively to the same stimulus according to what stimulus accompanied it. In explaining them the motor psychology has the great advantage of using the physiological basis worked out by Sherrington and in harmony with many known facts of the nervous system.

Gestalt vs. Concept as a Principle of Explanation. W. B. PILLSBURY, University of Michigan.

The *Gestalt* psychology differs from the older schools, not in its facts, which all admit and welcome, but in the type of explanation that it offers. In general, the *Gestalt* men insist, as do the vitalists that to name a phenomenon and to insist upon its importance is to explain it. The conceptual method, on the contrary, finds an explanation in referring the new to something that is already known. If the already known is generalized, it constitutes a concept, and the process is analysis. Decision between them can come only with the acceptance of one as the more satisfactory.

As we consider the abstract best in the particular, let us study movement, the first problem the new school attacked. Movement they argue from the fact that it arises equally well from a succession of discrete visual stimuli exposed in succession, or from actual passage of the visual stimulus across the retina, is a *Gestalt* independent of the way in which it is aroused. Wertheimer emphasized the Phi phenomenon, but that is not the *Gestalt* itself apparently but an incident.

The conceptual explanation is illustrated by Stern's suggestion that the appreciation of movement has as its cue a trail of after-images and that this cue arouses the notion of movement. I have frequently argued that these notions as of space and objects are probably in part developed in experience, but that is nonessential as is the particular character of the cue. Much more experiment is needed to explain both completely.

The crux of the difference lies between regarding merely stating that movement is a *Gestalt*, self-contained and prior to its parts, and stopping there on the one side and insisting on the other hand that we must refer it to notions different from itself, although not necessarily prior in time or independent of it in real existence.

The conceptual school must admit that analyses are never complete. We may even agree that the whole is the real and the parts as analyzed elements merely subordinate to it, that they mutually determine each other, and each of the other axioms of the *Gestalt* school. That school on the contrary itself seems to realize that mere naming is not all that is necessary from the fact that they themselves do enumerate the parts and have contributed much to the analysis of each of the problems they have attacked.

As attitudes the two schools are mutually complementary. With

the vitalists, they recognize the problems and have a continuing function in pointing out the inadequacies of the analyses at any particular time. To my mind that is but the beginning of the solution of the problem, which must be found in analysis of some type, limit it as we may.

The Predictability of Human Behavior. MARK A. MAY, Columbia University.

The practical aim of all sciences is the prediction and control of the phenomena with which they deal. The natural and the biological sciences appear to be far beyond the social sciences in achieving this goal. This paper raises the question as to how far psychology has gone in this respect and how far it may hope to go. What types or kinds of human behavior can we now predict and how accurate are the predictions and by what methods are they made? May we ever expect to predict human behavior with the same mathematical precision as that with which the astronomers predict the movements of the celestial bodies?

Considering first the limits of the problem we may inquire concerning whether there is anything in human behavior that renders it essentially and fundamentally unpredictable, except in a very broad and general way. Modern psychology seems to be proceeding on the assumption that all behavior is the resultant of a complex and for the most part unanalyzed set of causes; and that these are described roughly by the use of such terms as "conditioned reactions, instincts, tendencies, reason, will, etc." The main differences between human nature on the one hand, and animal, plant and inorganic nature on the other hand, are differences in degree of complexity. Theoretically at least human behavior is just as predictable as any other sort of activity, although it is much more difficult to analyze.

Human behavior may be arranged in types according to the ease of its predictability. We may recognize three or four levels:

(a) At the lowest level we have the stimulus response reaction typified by the simpler reflexes. Call this the (S-R) type.

(b) At the next level we have factors intervening between the stimulus and response which we may call "tendencies" or "urges". Call this the (S-T-R) type.

(c) At a more complex level we have learning coming in to modify the connections. We insert then another unknown factor in the equation (S-T-M-R).

(d) Then we may go even further and insert another set of unknowns called "deliberation" or "reflection" and complicate the equation still more (S-T-M-D-R).

Now, before we can predict any act we must know all the factors in the equation and know how each operates. At the lower end of this scale we can make fairly accurate predictions; at the upper end we cannot predict at all except in the most general way.

Psychology appears to have two methods of prediction. One the method of analysis or the qualitative method; the other the statistical or quantitative method. Both are in common use, but the statistical method carries the greater promise of general usefulness. Both methods need refinement and sharpening with prediction as the end in view.

The Postulational Principle in Psychology. A. P. WEISS, Ohio State University.

Psychologists have been slow in formulating the fundamental assumptions upon which their systems are based. To avoid the issue by maintaining that the mind-body problem belongs to metaphysics and to then feel free to disregard all efforts at scientific consistency by a random shifting from physical mechanism to psychophysical interaction, often on the same page of the text, leaves the careful reader in a hopeless confusion as to the systematic status of the writer and of his system, and prolongs the literary as opposed to the scientific phase of psychology.

The mind-body relationship is essentially a psychological problem and must be settled by psychologists. Of the fundamental relationships that are relatively independent of each other, and which have adherents, we may list the following: physical monism, psychical monism, physical epiphenomenalism, psychical epiphenomenalism, psychophysical parallelism, psychophysical interaction, monodualism.

If writers in psychology will indicate their systematic status and then elaborate this into about ten postulates covering the content of their books, they may hope to have their work criticized on a scientific rather than on a literary basis. No one is as competent to formulate his fundamental assumptions as the writer himself. If the postulates are clearly stated in a special section of the book, they become the authoritative point of view of the particular writer, and any deviation in the text may then be regarded as an inconsistency. The mere fact that the writer is expected to formulate his assumptions

will have a restraining effect on the writer and result in greater uniformity in systematic psychology. Such questions as: Are there any instincts? Are there any emotions? What is consciousness? What is mind? etc., tend to disappear under the postulational method, because every writer is forced to take an unambiguous stand with reference to them.

MONDAY, DECEMBER 28, 10:30 A.M.

PROGRAM B

EXPERIMENTAL PSYCHOLOGY

The Positive After-Image of Twilight Vision. FOREST L. DIMMICK, Hobart College.

Under conditions of partial dark adaptation, with a stimulus of moderate intensity, some observers have reported positive after-images that exactly reduplicate the presented stimulus in color, form, etc., and that approach it in intensity. Under similar conditions but with carefully controlled dark adaptation and with brief stimulation we have elicited after-images that bear all the earmarks of twilight vision. They are positive; light objects appearing light in the after-image, and dark objects, dark. They lack "color," however, and the influence of the Purkinje phenomenon and of foveal blindness is apparent. In terms of the von Kries duplicity theory we must ascribe this after-image to the functioning of the rods.

Form Perception in Indirect Vision. L. R. GEISSLER, Randolph-Macon Woman's College.

Our aim was to secure reliable results concerning the nature and accuracy of form perception in the extrafoveal regions of the retina; a problem which may have some bearing upon the *Gestalt theorie*. We employed Spul's self-recording perimeter (manufactured by Meyrowitz) with two modifications: (a) an observation tube was fastened between the eye rest and fixation mark, to control fixation; (b) the metal disc carrying the five color stimuli was replaced by a black cardboard disc of the same size, carrying five white forms, i.e., a square, triangle, diamond, sector, and circle, whose dimensions were such as to cover areas of about 80 sq. mm. each. A frosted electric light fastened above the observer's head was the only source

of illumination in the dark room. The right eyes of three advanced students and both eyes of the writer were tested along the horizontal diameter 0-180, the vertical diameter 90-270, and two intermediate diameters. The nearest approach of the stimuli to the fixation mark was an angle of 25 degrees, the other positions investigated occurred at 5 degree intervals to the periphery of invisibility. We therefore obtained 20 judgments on every position, with the right eyes of four people. The observer adjusted his eye to the opening of the observation tube and signalled when he had obtained a satisfactory fixation. Immediately afterward the experimenter exposed one of the five forms (in haphazard order) along one of the diameters for two or three seconds. The observer had to recognize the form by indirect vision and name it, or else describe briefly what he had seen. Preliminary trials with the writer only as observer misled us to expect 100 per cent correct judgments at the 25 degree position. Reports which named the correct form, but with explicit doubt, *e.g.*, "perhaps a sector or triangle," were counted half right and half wrong. The results as a whole showed a gradual but not uniform increase in per cent of wrong judgments towards the periphery, with few inversions. Of the five forms used the circle was judged correctly more often, and the sector less often, than any other figure. The latter was frequently mistaken for the triangle, although the triangle was also almost equally often confused with the square and the diamond. The fewest errors occurred in the horizontal diameter, the largest number in the vertical. Individual differences are probably related to slight defects of the eyes tested.

The Effect of Mixing Artificial Light with Daylight on Important Functions of the Eye. C. E. FERREE and GERTRUDE RAND, Bryn Mawr College.

This study was made under the auspices of the National Research Council's Committee on Industrial Lighting. The following points are covered: (1) A comparison was made of the effect of artificial light, daylight, and mixtures of artificial light with daylight, on acuity, speed of vision, power to sustain acuity, and ocular fatigue. In each case the intensity of illumination was made the same and the eye was fully adapted to the illumination used. The object of these experiments was to ascertain whether there is anything detrimental to the eye in the mixture of artificial light and daylight so far as color and composition are concerned. (2) In a second series of experiments

the artificial light was turned on at different times in the late hours of the afternoon on different days and the effect on speed of vision was determined. In these experiments the tests were made at intervals of fifteen minutes, beginning early or in the middle of the afternoon and continuing until after darkness was complete. These results give a history of the eye's performance under the changing intensities of afternoon light until the artificial light was added, the immediate effect of adding that light, and the effect from then on until a constant state of performance was reached. An opportunity is thus had to see directly the effect of adding the artificial light on the powers of an eye that has been subjected to the actual conditions under which all our eyes are placed in a working day that lasts until or after nightfall. (3) In a third series of experiments a brief study of the problem was made in relation to the adaptation of the eye. The object of this study was to show to what extent the eye is rendered deficient in the late hours of the afternoon by its previous exposure to a light of high intensity and by its failure to keep pace by adaptation with the change of intensity.

The results of these experiments are discussed in relation to the problem of afternoon lighting and to the current belief that the mixture of artificial light with daylight is not desirable.

The Blue Arcs and the Blue Glow of the Retina. CHRISTINE LADD FRANKLIN.

The optic fibers (certain ones of them most certainly, but nearly all of them under favorable circumstances) are visible—shine apparently with a slightly reddish blue light in a dark room—when they are stimulated. This extraordinary phenomenon has been independently discovered and announced as a new discovery—most recently from Clark and from Harvard—some eight or ten times. The only explanation that has ever been given of it—that it is some sort of an induced current (1) in adjoining fibers, or (2) in nearly adjoining ganglia—is manifestly impossible. What I find it necessary to call the “place-coefficients” of the visible fibers are incompatible with one explanation, and the fact that there is no character of a *ganglion* which would permit it to suffer any sort of induced excitation when the still nearer nerve *fibers* escape is incompatible with the other explanation. But it is well known that specific energy radiations are given off by fibers when conducting a nerve impulse, and it is easy, in the light of this experience, to suppose that they may

come within the visible range of frequencies, and that they account for the phenomenon. In any case, of course, it may correctly be said that one is "seeing" his own nerve currents.

The existence of this phenomenon requires not only the introduction of the term "place-coefficients," but also a restating of the principle of specific energy.

The Effect of Rate of Retardation on Post-Rotation Nystagmus.

KNIGHT DUNLAP and R. M. DORCUS, The Johns Hopkins University.

The question of the influence of the rate of acceleration (positive and negative) in determining the duration and character of nystagmus due to rotation stimuli well above the threshold is important for the standardizing of rotary stimulation in various lines of vestibular research. We have done exploratory work by subjecting a group of men to series of rotation in which, (a) the number of turns, (b) the rate of rotation, and (c) the positive acceleration have been kept as constant as possible, while (d) three rates of negative acceleration (retardation) have been employed, for comparative observation of the post-rotation nystagmus. Although the results are not final, and indicate the need of more precise methods of measurement, they are nevertheless indicative of relationships which could not have been predicted, and which are of serious moment.

Controls Employed in Relation to Experiments in the Identification of Speech Sounds by Tactile Criteria. ROBERT H. GAULT, Professor of Psychology, Northwestern University, on leave with the National Research Council.

The author summarizes the results of his experiments with tactile criteria as means of identification of elementary sounds, words, isolated sentences and connected sentences. Very definitely favorable reactions have been demonstrated in all these relations. In order that these reactions may be correctly evaluated various controls have been inaugurated from time to time. These have been aimed at the exclusion of interference by auditory stimuli either through the air or by way of bone conduction to the inner ear.

A—Controls against hearing through the air.

1. Selection of cases whose audiometric record is low: 0-0 to 45-55.
2. Removal of the experimenter to so great a distance that a

person of normal hearing seated with the observers cannot hear his voice and by enclosing the subject's hand with the vibrating receiver in an approximately sound proof box.

B—Controls against hearing by way of bone conduction.

1. Selection of cases whose audiometric record is low: 0-0 to 45-55.

2. Application of vibrating receiver to the palm and to the temple in alternating series on the hypothesis that if hearing by bone conduction is a fact there should be a higher proportion of identification in the second series than in the first.

3. Experiments upon persons of normal hearing. Two series, employing in each an approximately sound proof box to contain the receiver. In one series the subject has advantage only of what auditory cues pass through the box. The second series has the same advantage plus whatever cues may be obtained through bone conduction, because in this series his palm or finger is against the receiver in the box. If bone conduction is a factor he should be able to identify a larger proportion of stimuli in the second situation than in the first.

Conclusion: No evidence for bone conduction to the inner ear has been found.

Local Signs as Orientation Tendencies. JOSEPH PETERSON, George Peabody College.

The somewhat mysterious "local sign" of subjective psychology was never satisfactorily explained, either as innate or as acquired, and it has given much trouble both to nativists and empiricists. Assumptions of inherent volume in sensations was as absurd as space constructed from spaceless sensations. Another difficulty was the assumption that there must be some conscious element which determines location. Differences arose as to whether this element was a "total feeling," a sensation of movement, or a "peculiar shading" of sensations. These difficulties to introspectionists have unfortunately led some behaviorists to disregard a body of objective facts on tactual localization and discrimination, and on perception in general.

"Local signs" may be regarded merely as orientation tendencies built up by a trial and error process as follows: afferent impulses from stimulation at any point, p , change concurrently (and become associated) with efferent impulses only when the latter effect move-

ments of the member or part stimulated. Other movements do not modify or become associated with them. Local signature on this view becomes only a special case of learning and habit, and readily enlarges itself into the whole field of "perception" as spatial and temporal orientation. Even illusions and hallucinations are susceptible of a wholly objective treatment, being results of the stimulation of certain reaction patterns under various unusual conditions which may be severally ascertained.

Three classes of facts which have given trouble to introspective psychology—markedly better discrimination in certain areas than in others, better discrimination to transverse than to longitudinal and to successive than to simultaneous stimuli—are easily handled on this behavioristic basis, and the illusion of displacement toward the more movable parts of the bodily surface is just what one would expect. In general, wherever on the body surface mobility is greatest, discrimination units of behavior are relatively large as compared with anatomical units. A given distance near the finger tips is for discriminative reaction much larger than it is on the forearm; hence if S is asked to touch a point stimulated on his arm he locates it too far out in the distal direction. If he is asked to estimate distances proximally, as compared with distances distally measured from a given point with the two points of a compass, he overestimates those measured in the latter direction. An experiment to illustrate the method of formation of local signs is outlined and some genetic studies in orientation to local stimulation are suggested.

MONDAY, DECEMBER 28, 2 P.M.

PROGRAM A

GENERAL PSYCHOLOGY

The Refractory Phase Hypothesis of the Nature of Inhibition.

RAYMOND DODGE, Institute of Psychology, Yale University.

The hypothesis that inhibition is due to the development of a more or less protracted refractory phase in the tissues whose action is inhibited originated with Verworn. It involved a reinterpretation of available data and has been investigated in a long series of experimental studies which reached their climax in the work of Vészi and Froelich in Germany, Keith Lucas and Adrian in England, and

Forbes in America. The experimental evidence cannot be lightly dismissed. The hypothesis, however, is not without its difficulties: (1) If a neurone is brought into a refractory phase, it is difficult to explain how the consequent inhibition could give place to excitation by any additional stimulus whatsoever. (2) Refractory phase inhibition implies a preliminary excitation phase which is not discoverable in many phenomena of apparent inhibition. (3) By many of those who are most competent to judge inhibition is regarded as something positive, not a purely negative process of quelling or blocking something in progress. (4) Pavlov holds that inhibition spreads or is conducted from one part of the nervous system to others. Refractory phase is apparently localized. (5) If the all-or-nothing law holds true in the central nervous system, the graduation of response as the absolute refractory phase gives place to relative refractory phase, is difficult to understand.

An Essay Toward an Adequate Explanation of Sleep. H. M. JOHNSON, Mellon Institute of Industrial Research, University of Pittsburgh.

"Sleep" is characterized by an enormous decrease in the activity of the postural musculature, and by an enormous increase in the magnitudes of the stimuli, or the number of stimuli, necessary to effect a specific and integrated response. Another primary characteristic is its dependence on habit: a feature which none of the anatomical, chemical, or neurological theories that have gained popularity are capable of explaining.

C. J. Herrick disposes of these hypotheses by saying: "There is no direct evidence for any of these theories, and the scientifically correct attitude toward them is frankly to admit that we do not know what physiological processes are involved." In Herrick's book, however, are presented certain facts, which, when properly assembled, adequately account for most, if not for all, the phenomena of sleep capable of being directly observed. The explanation can be framed simply, in terms of the mutual reinforcement and the substitution of organized reaction arcs. Its germ was mentioned by I. H. Coriat, who, however, did not develop it fully, and who combined it with various irrelevancies.

The maintenance of bodily posture depends on the continuous activity of a very large and intricate neuromuscular system. This activity is of the serial, or "chain-reflex" type, involving discrete

and repeated contractions, now of one group, now of another group, of cells within a given muscle. Each contraction, by irritation of the sensory "spindles," excites the afferent portion of a homeodetic arc, and renders a supply of nervous flux available for distribution to other effectors, as well as for reëxcitation of the ones in which it was excited. It is not improbable that the greater portion of the flux utilized in any response is generated in these internal receptors. The quantity generated by external stimuli is ordinarily insufficient to arouse a highly coördinated and specific response without such reinforcement. In sleep, this reinforcement being lacking, stimuli of ordinary magnitudes, numbers and frequencies, are subnormally effective.

It follows from these considerations that any agent which will produce sufficient postural relaxation will evoke the phenomena of sleep. In fatigue, asphyxiation and narcosis, relaxation appears to result from muscular acidosis; the effectors, being less negative than normally with respect to the receptors, become less irritable. If other stimuli systematically accompany these agents, they may become effective substitutes for the latter, as in any other case of habit formation. Thus, sleep, as a conditioned response, may occur in the absence of a demonstrable "bodily need."

Principles of the Work Decrement. EDWARD S. ROBINSON, The University of Chicago.

This paper is the outcome of a study of those "laws of relative fatigue" which Professor Dodge presented to this association in his presidential address. (PSYCHOLOGICAL REVIEW, 1917.) Excluding refractory phase, there are, according to Professor Dodge, two other fundamental principles of the work decrement. It is my thesis that accuracy and completeness demand the elaboration of these principles. Such an elaboration is embodied in the following seven propositions:

- (1) The work decrement of a given S-R (stimulation-response) connection is relative to the recency of the previous functioning of that connection.
- (2) The work decrement of a given S-R connection is relative to the frequency of the previous functioning of that connection.
- (3) The work decrement of a given S-R connection is relative to the nature of the connections between that S and other R's.

(4) The work decrement of a given S-R connection is relative to the strength of that specific connection.

(5) The work decrement of a given S-R connection is relative to the qualitative integrity of the S throughout the work period under consideration.

(6) The work decrement of a given S-R connection is relative to the quantitative constancy of the S throughout the work period under consideration.

(7) The work decrement of a given S-R connection is relative to the work decrements which have occurred in other S-R connections.

The Logic of Affective Psychology. PAUL THOMAS YOUNG, University of Illinois.

Recent experimental literature of affective psychology has revealed contradictions of an apparently unsolvable nature. Uniformities may be found where a group of subjects have had common psychological training and where they have been submitted to common laboratory conditions. If practical subjects be submitted to different conditions so that a new observational set is established, the so-called facts of affective psychology are changed and new, perhaps opposed, data result. Only by regarding the facts of affective psychology as wholly relative to observational settings can the present situation be adequately portrayed. The case is strictly analagous to the training of a group of animals so that they will perform uniformly now one trick and now another new and perhaps incompatible trick. The fundamental question is not whether this or that trick of observation is true or false, but rather how did the creature get that way.

The assumption that there are unique mental processes of pleasantness and unpleasantness must now be abandoned until their existence can be adequately demonstrated. The report of affective processes is one of the products of special training and theoretical bias. It can no longer be assumed that mere practice in observation, apart from laboratory bias, suggestion, special training, and an attempt to demonstrate a preconceived notion, will reveal uniformities of affective experience. The truth of a statement in affective psychology rests upon experimental conditions in such a manner that logically opposed statements may be equally true or equally false. Furthermore, the question of their truth or falsity is as irrelevant to the basic questions of psychology as the question whether or no this trained dog performs his trick better than that one.

The entire perspective or affective psychology needs to be changed. There are data which are relatively independent of special training and bias. Such types of behavior as vomiting, the movements associated with bodily injury, the restless movements accompanying starvation and internal disease, groaning, crying, etc., are generally taken to be expressions of disliking, regardless of the theoretical opinions of the afflicted person. On the other hand, the sight and smell of well-cooked food and the eating of the same when hungry, the specific sex responses, and probably other basic types of behavior are quite generally taken to be expressions of liking, regardless of the psychological training of the subject. If we knew something about the basic affective reactions, we could then proceed to study the conditioning and reconditioning of likes and dislikes, and we could proceed to investigate the physiological processes of liking and disliking, and incidentally we could escape the futility of the present situation.

Affection From the Standpoint of Complete Introspection. RAYMOND H. WHEELER, University of Kansas.

The "complete introspective method" is an analysis of mental processes including their "settings" and their relationship to "periods of interpretation." A preliminary study of affection from the standpoint of this method indicates that our psychology of affection and related processes is to pass through a transition stage as important as a recent development in the field of perception. Data were obtained from twelve subjects under a variety of conditions.

Affection turned out never to be simple but always a pattern, usually a tactual-kinesthetic pattern, but rarely free from visual content, and in two synesthetic subjects, almost exclusively visual. Both pleasantness and unpleasantness underwent limited amounts of attenuation, but they were variable in their content in different observers and at different times in the same observer. Mechanized patterns consisted of motor attitudes and verbal characterizations, in certain instances synesthetically translated. In no instance where the interpretive period was discovered was there a residue of affection but where the interpretive period was not discovered there were residues which were not elemental contents resisting analysis but unanalyzed complexes taxing, for the time being, the observer's ability to analyze and remember.

The content both of pleasantness and unpleasantness is conditioned, necessitating a history of the process in the individual case to explain it. Feeling is a relatively undifferentiated "intellectual" process, a fact which has long been insisted upon without systematic evidence. This throws light upon the problem of intuition.

Analytical attitudes toward the stimuli caused pleasantness and unpleasantness to disappear; but the affective experience itself passed through alternate stages of destruction and construction. Confusion between the analyzed and the unanalyzed condition of affection and mental "sets" against, or, an inability to recognize vague, diffuse, organic and kinesthetic processes seem to account for the differences between these results and those of previous investigations. While affection is a sense-imaginal pattern from an analytical standpoint, it is a meaning, a process of interpreting, from the functional standpoint. An adequate psychology of affection must take both viewpoints into consideration. Predictions of affective behavior will depend, in general, upon a study of the functional problem, with a solution of the structural problem necessary for finer work.

The Development of Laboratory Equipment in the United States.

CHRISTIAN A. RUCKMICK, State University of Iowa.

The growing interest in test methods and the space advertising "paper" test materials in psychological journals and manufacturers' announcements led me to inquire into the relative and absolute financial value of apparatus in our American psychological laboratories. Questionnaires were accordingly prepared, with amounts to be filled in for: (1a) the present total evaluation of laboratory apparatus, and (1b) of test material, (2) present annual budget for these separate items, and (3) any special funds like endowments received for these purposes. Information was also requested concerning the employment of a mechanic and the extent to which he constructed new apparatus.

Concerning the proportionate amounts devoted to undergraduate and graduate needs, and to pure and applied psychology respectively, out of sixty requests, thirty sent replies that were adequate for comparative treatment. I believe that these are fairly representative of other institutions not heard from, because from personal knowledge of the laboratories omitted, I feel that they are as well equipped on the whole as those whose evaluations are tabulated. The total estimated evaluation of apparatus from these institutions given in detail shows

a sum of about \$300,000, or \$10,000 per institution, ranging from \$100 to over \$30,000. Since I am sure that this sum could be doubled from the omitted institutions, I should estimate a total evaluation of apparatus at about \$600,000 for the sixty institutions to which inquiries were addressed. A conservative guess of the evaluation of all psychological apparatus in the universities, colleges and normal schools of this country would approximate one million dollars.

The average annual budget is in the neighborhood of \$1,000, ranging from \$50 to \$3,000. This is about twice the amount appropriated according to a study made of twenty-one institutions in 1911. The comparison between test material and apparatus for pure psychology revealed few significant facts, because of the variety of arrangements obtaining in the different institutions. Where comparisons could be made, the amount appropriated for pure psychology was well over twice that for applied.

Further studies of the early catalogues issued from Harvard and Cornell Universities published about three decades ago reveal some interesting comparisons with modern laboratory equipment. The paper develops further some information obtained from the manufacturers of psychological apparatus in regard to shipments of apparatus abroad, especially to the Orient.

MONDAY, DECEMBER 28, 3:00 P.M.

PROGRAM B

EXPERIMENTAL AND COMPARATIVE PSYCHOLOGY

An Experimental Study of Backward Association. HULSEY CASON, Syracuse University.

Does the forward learning of the items 1-2-3-4-5 result in the formation of backward associations, and facilitate the later learning of the items in the order 5-4-3-2-1? Thirty-one subjects worked in an individual procedure and learned lists of nonsense syllables or lists of short familiar words. Tests were given on later occasions to determine whether the forward learning had resulted in the formation of associations in the backward direction. Although the results seem to favor this theory, which is true as a practical proposition in laboratory situations, the tests also indicate that when rote material

is used some factors in the learning situation cannot be adequately controlled.

A different group of thirty-one subjects worked in an individual procedure and learned sets of logical prose material. The procedure used was very similar to the learning situations of everyday life. The results show that very few backward associations are formed, and that the learning of logical material results in a condition which inhibits the later learning of the same items in the reverse order.

The related question of forward remote associations was also investigated with seventeen subjects, who worked in an individual procedure with logical prose material. The results are for the most part negative.

Several variations of the experiment support the proposition that learning a series of items in the forward direction does not necessarily result in the formation of remote associations. The general conclusion is in favor of specific connections.

Transfer and Inhibition in Learning Right and Left Stylus Mazes.

LINUS W. KLINE AND HELEN I. STEVENSON, Skidmore College.

Two mazes of the Hampton Court type were used. They were alike in all respects except that one was for the right hand and the other, reversed, for the left hand. Both mazes were screened by curtains from the subjects, eight of whom, not blindfolded, traced the runways with a wooden stylus. All subjects learned both mazes and were required to begin with the right or left hand and with the right or left maze in such order as to eliminate practice effects and to reveal factors of transference and of inhibition.

The path of the stylus in threading the runways during a trial was completely registered on carbon paper, thereby preserving fully all the features of the individual's movements.

When a maze was fully learned, as judged by a standard, the subject drew it as he believed it to be. These drawings were made once a week from one to three months and furnished material for studying the relations between a particular mode of learning and the accuracy and stability of the maze-memory.

The priority of the methods as to economy of time, elimination of errors, accuracy and length of memory were in the order of verbal, visual-motor and motor.

Subjects making a relatively large number of errors during the initial trials learned more easily and rapidly than those who escaped

errors in the beginning. The latter made slow progress and a larger proportion of errors in the middle stages of practice.

The transfer of skill from either hand to the other was well nigh complete. The results also indicate that it is easier to learn a maze with its corresponding hand and the opposite one with its hand than to learn the same maze with each hand in turn.

Standardization of Methods for Studying Anthropoid Behavior.

HAROLD C. BINGHAM, Yale University.

This paper is concerned primarily with the qualitative methods that have been used in demonstrating insight in the anthropoid mind. As guides in our preliminary orientation these methods have rendered valuable service, but their use has also opened up scores of questions that hinge, first of all, upon a critical survey of the various experimental procedures that have been produced.

Investigators working with a different species of anthropoid ape have devised a variety of methods which require comparative evaluation. Moreover, these preliminary investigations have been made under improvised and, therefore, varying conditions which render results incomparable despite the fact that supposedly similar methods have occasionally been used.

Before uniformity in procedure can be recommended, it behooves us to select and develop empirically the best of available methods. As the result of such work, we may hopefully look forward to graded series of mental measurements for ready use in making direct comparisons among different primate groups. Meanwhile, of course, our knowledge about the mind of primates must continue to increase.

Preliminary work in the evaluation of objective methods is now under way at Yale University in the Institute of Psychology with young chimpanzees as subjects. Particular attention is being given to the establishment of describable and repeatable conditions in such types of method as the use of tools to attain objectives, problem boxes as barriers to objectives, and "round-a-bout" routes to reach objectives. Even such simple barriers as bars or wire mesh can be varied so much that empirical evaluations are essential before the more desirable procedures can be prescribed.

It is no longer a pertinent question to ask whether the chimpanzee can solve such performance problems, for several investigators have

answered that preliminary question in the affirmative. Even the manifestation of ideational behavior has been unmistakably observed. An important step beyond these qualitative results, demanded in all comparative psychology, must be taken in the direction of increased uniformity in order that different subjects may be confronted with known and comparable tasks.

A Study of Direction-Sense in Animals. J. F. DASHIELL, University of North Carolina.

A maze was so devised that a variety of pathways led from entrance to exit. Each of the white rats used learned in a few trials to find its way to the exit without error—but by a wide variety of routes in successive trials. All the known factors that might serve as direction-indicators were eliminated or checked; and the problem arises as to just how the animal is able to maintain a general orientation while going through a series of right-left turns that vary irregularly from trial to trial. It is suggested that some kind of motor set might be established as the animal first enters the maze, and then as it turns to right or left some compensatory mechanism maintain a tendency to left or to right until such turn is actually made. References are made to the sensitiveness of the white rat to proprioceptive stimulations, and to different well-known compensatory reflexes.

The Effect of Menotoxin Injections on the Behavior of Rats in the Circular Maze. DAVID I. MACHT AND O. HYNDMAN, Johns Hopkins University.

Macht and Lubin have shown that in the blood, sweat, saliva, milk and other secretions of menstruating women there is present a toxic substance which is especially deleterious to plant protoplasm but is also to a lesser degree poisonous for animals. This substance or menotoxin they considered to be chemically related to oxycholesterin and allied compounds, such as cholic acid. It is well known that women at the time of catamenia suffer from a great many symptoms referable to a great number of profound disturbances in the nervous and psychic spheres. In the present investigation an attempt was made to study the effect of injections of menstrual toxin in order to determine whether it had any bearing on such symptoms. Albino rats were trained in the circular maze and the injections of normal

human blood serum on the one hand and of menstrual blood on the other hand, were given. In order to avoid anaphylactic phenomena the same animals were not injected a second time except after long intervals.

Fifteen experiments were made with injections of normal serum and twenty-one experiments with injections of menstrual serum, the doses administered ranging from .01 to 0.2 c.c. It was found that normal blood serum given in such doses subcutaneously or intramuscularly produced either no effect or a slight depression of a very transient character. On the other hand injections of menstrual blood serum produced a very marked depression in animals as evidenced by very slow progression and numerous errors. After large doses there was distinct paresis of the hind limbs noticed. All the animals recovered from the toxic symptoms within forty-eight hours. Injections were also made with alcohol extracts of normal blood serum (evaporated and taken up in saline) on the one hand and of menstrual serum on the other hand. Similar results as with the serum itself were obtained. Blood serum from pregnant women was not found to be toxic.

The depressant effects were noted after injections into both male and female rats.

Sexual Behavior of Male Rabbits After Destruction of Large Areas of the Cerebral Cortex. CALVIN P. STONE, Stanford University.

The dorsal and dorsolateral portions of the cerebral cortex of male rabbits were removed by cautery. From tests of sexual activity and fertility made both prior and subsequent to the operations, one may conclude that all of the dorsal and dorsolateral cortex of the cerebrum may be removed in the male rabbit without causing impotency or sterility.

MONDAY, DECEMBER 28, 4:30 P.M.

EXHIBITION OF APPARATUS AND TEST MATERIALS

MONDAY, DECEMBER 28, 8:00 P.M.

ANNUAL BUSINESS MEETING

TUESDAY, DECEMBER 29, 9:00 A.M.

PROGRAM A

SESSION FOR INFORMAL REPORTS BY GRADUATE STUDENTS

Sensory, Secretory and Electrical Changes in the Skin During Bodily Excitation. C. W. DARROW, University of Chicago, introduced by H. A. Carr.

The Regeneration of Cutaneous Nerve. HARRY HELSON, University of Illinois, introduced by Karl M. Dallenbach.

Psychological Studies of Fasting. J. A. GLAZE, University of Chicago, introduced by E. S. Robinson.

A Comparison and Calibration of Tests of Psychological Impairment, Produced by Narcotics and by Fatigue. GEORGE E. WIEGAND, Mellon Institute of Industrial Research, introduced by H. M. Johnson.

The influence of Muscular Tension on the Efficiency of Mental Work, ARTHUR G. BILLS, University of Chicago, introduced by E. S. Robinson.

Further Data on Conditioning Emotional Reactions. THOMAS L. BAYNE, Cornell University, introduced by Paul J. Kruse.

A Study of Reminiscence and Obliviscence. OSBORNE WILLIAMS, University of Chicago, introduced by H. A. Carr.

The Dependence of Learning and Recall Upon Prior Mental Activities. P. L. WHITELEY, University of Chicago, introduced by H. A. Carr.

The Criteria of Confidence. F. H. LUND, Columbia University, introduced by H. L. Hollingworth.

Correlation of Physical, Mental, and Social Traits. W. H. SHELDON, University of Chicago, introduced by L. L. Thurstone.

The Measurement of Sociability. RUTH BURKE, Northwestern University, introduced by A. R. Gilliland.

Three Measures of Report Ability and their Correlation with Intelligence. J. A. McGECH, University of Chicago, introduced by H. A. Carr.

Techniques for Determining Undesirable Behavior in School Children. WILLARD C. OLSEN, University of Minnesota, introduced by M. E. Haggerty.

A Survey of Personnel Blanks in Use in Colleges of the United States. ZOE EMILY LEATHERMAN, Ohio State University, introduced by H. H. Goddard.

A Case Study of Discrepancies between Mental Ability and Achievement through Four Years of College. E. L. BAKER, Cornell University, introduced by Paul J. Kruse.

TUESDAY, DECEMBER 29, 10:00 A.M.

PROGRAM B

APPLIED PSYCHOLOGY

How Should Psychology Be Applied? MAX FREYD, Personal Research Federation.

Applied psychology has been called the application of the methods and findings of psychology to problems of daily life.

The psychologist who carries out experiments in the selection of industrial workers is not an applied but an experimental psychologist. The vocational adjustment of adults is as legitimate material for experimental psychology as the unlearned behavior of the infant or the reaction time to visual and auditory stimuli. All are studied by the scientific method and results are obtained which enable us to predict behavior.

Applied psychology considered as "the application of the findings of psychology to the affairs of daily life" gives the layman a false impression of security in the use of these findings. The material made available to employment managers and advertisers in recent volumes is applicable only under the conditions which attended its original establishment. We find even psychologists advocating the

use of this material without accurate investigation of its applicability to the particular problem.

Since psychological problems especially in industry seldom repeat themselves with the same relationship of variables, and since in any event it is difficult to judge by inspection whether or not the variables are in the same relationship, it is suggested that practicing psychologists drop the term applied psychology and be known as either experimental psychologists or simply psychologists, and that with regard to every problem they face they maintain the research attitude, making no applications of findings which are not validated for the particular problem.

Personality and Dominant Interest: Vocational Tendencies of Introverts. W. V. BINGHAM, Personnel Research Federation.

The importance of personality traits for success in many occupations and careers is undoubted. More or less dependable measures or indicators of these essential traits are rapidly in process of development. But for the present, any gesture in the direction of practical utilization of these measures as aids to vocational decisions should be made with the utmost hesitancy, in view not only of their necessarily low reliability but also of the instability of the very personality characteristics whose share in vocational success is obvious.

Fresh evidence is cited, confirming and extending Freyd's findings as to differences in personality of the socially and the mechanically inclined. Persons with tendencies toward introversion are relatively more frequent in vocations requiring ability to deal with concrete objects or mechanisms, with ideas, with written words, symbols, numbers or other abstractions. But where success demands first of all efficiency in social contacts, as in military command, politics, factory management, office supervision or selling, extroverted personalities seem to be relatively more common. Accountants, engineers, novelists and poets are often more or less introverted. The scholarly college professor, also is apt to show tendencies toward introversion, especially if he belongs to the research type. The successful business man more often exhibits the opposite tendency.

What is the explanation of this connection between certain sorts of vocational ability and tendencies of personality? The theory is advanced that—whatever the degree of native interest or ability in dealing with mechanisms, with ideas or with people—early introversion tends to develop through disproportionate exercise the inter-

ests in mechanisms or in ideas, at the expense of interest and proficiency in social contacts.

Evaluation of Criteria in Vocational Selection. MORRIS S. VITELES,
University of Pennsylvania.

Investigations in tests for the selection of employees have been characterized by neglect in the evaluation of the criteria of industrial efficiency. An analysis of a number of investigations shows that the criteria used are altogether inadequate as descriptions of the accomplishment of workers in the field for which tests are being prepared. Studies made by the writer in the selection of sales people, motormen and taxicab drivers show that the apparent reliability of a test is too often a factor of the criterion with which the test results are compared. Criteria which, on the surface, seem to be equally valid give entirely different correlations. The problem for further experimental investigation is that of evaluating the validity of criteria rather than that of the construction of new tests and their comparison with criteria which have not been evaluated. The formulation of a joint research program for the study of criteria of success and failure in industry as a preliminary step toward the more scientific evaluation of the use of tests in selection is recommended. It is suggested that both industrial investigators and committees such as that recently appointed on Tests for Drivers under the auspices of the National Research Council might very well devote their energies to a study of criteria, in preference to the construction of new tests which can only be inadequately evaluated against criteria whose reliability has not been scientifically determined.

Labor Turnover Among Psychologists. HARRY DEXTER KITSON,
Columbia University.

In order to institute vocational guidance for prospective psychologists, as the National Research Council has proposed, it is necessary to find out some of the conditions under which psychologists work; to portray these conditions graphically; and make them available to persons who are contemplating entering the vocation of psychologist.

As a preliminary step in this direction the writer has made a study of the turnover among the members of the American Psychological Association from year to year, the phases examined being,

(a) termination of service in one employing institution, and, (b) promotion in rank within the same institution.

The data were taken from successive issues of the year-book of the association. Curves have been established for the number of resignations and promotions. Comparisons have been made between these figures and similar figures in industrial establishments and in an educational institution similar to those in which most of the psychologists are employed.

Attention is called to other kinds of "personnel" data about psychologists which can be gathered by similar objective methods, and their significance is shown not only for the administration of vocational guidance among psychologists but also for the intelligent interpretation of trends within the vocation.

Psychological Research in Athletics. COLEMAN R. GRIFFITH, University of Illinois.

Athletic competition extends a three-fold invitation to the psychologist. There is, first, the call to a genetic and descriptive study of play in its organized forms, together with the need of establishing the social usefulness of play in an era of increased regard for athletic sport. There is, secondly, the invitation to apply to athletic performance the facts and principles of psychology that have already proven useful in other departments of psychotechnology. There is, thirdly, the invitation to make a critical and experimental study of practically untouched modes of experience and types of behavior common to athletes, athletic teams and crowds.

Psychologists have already accepted the first invitation and there are now several critical studies on play, its origin, its social significance, the like. The second and third invitations have been almost disregarded. A hearty acceptance of them is made possible through the Laboratory of Psychological Research in Athletics recently established by the Athletic Association of the University of Illinois.

This paper continues with a description of the applications of psychology to athletic performance which have already been undertaken, together with a statement of new research in the field.

Job-Analyzing Athletics. C. H. BEAN, Louisiana State University.

This is the first report on a research now in progress that has as its aim the job analysis of athletic sports. It is an effort to find

what mental and physical differences exist between persons who succeed and those who fail in their efforts to earn membership in the athletic teams.

The plan is to discover what mental and physical factors are involved in each of the branches of athletics and to find the degree of correlation between these factors and athletic success.

Results have been obtained thus far from a limited number of men in the leading games, in track and in field sports in relation to intelligence and to perception-choice-reaction time.

Coaches of football, baseball, and basket ball arrange the names of all the men whom they have schooled for their games in the order of their athletic capabilities and assign to each a percentile rank. This is done also by trainers in track work and field work.

A significant positive coefficient of correlation between the games and intelligence, zero correlation between track work and intelligence and a small positive coefficient between field athletics and intelligence have been found. There are indications that a positive correlation, lower than in the case of intelligence, will be found between the ratings for the three games and perception-choice-reaction time.

TUESDAY, DECEMBER 29, 2:00 P.M.

CONFERENCE OF EXPERIMENTAL PSYCHOLOGISTS

ROUND TABLE CONFERENCE ON THE MEASUREMENT
OF CHARACTER AND PERSONALITY TRAITS

ROUND TABLE CONFERENCE ON PSYCHOLOGICAL
CONSULTATION FOR COLLEGE STUDENTS

ROUND TABLE CONFERENCE ON CLINICAL
PSYCHOLOGY

TUESDAY, DECEMBER 29, 4:30 P.M.

BUSINESS MEETING OF THE SECTION OF CLINICAL
PSYCHOLOGY

ROOM 190, GOLDWIN SMITH HALL

TUESDAY, DECEMBER 29, 7:10 P.M.

ANNUAL DINNER

TUESDAY, DECEMBER 29, 8:00 P.M.

ADDRESS OF THE PRESIDENT

THE MAJOR CATEGORIES OF PSYCHOLOGY

MADISON BENTLEY

UNIVERSITY OF ILLINOIS

WEDNESDAY, DECEMBER 30, 9:00 A.M.

CONFERENCE OF EXPERIMENTAL PSYCHOLOGISTS

WEDNESDAY, DECEMBER 30, 9:00 A.M.

PROGRAM A

CLINICAL PSYCHOLOGY

The General Personality and Certain Features of the Sex Life, with Special Reference to Instruction. F. L. WELLS, Psychopathic Hospital, Boston.

A report of work done under auspices of the Committee for Research on Sex Problems, Division of Medical Sciences, National Research Council. It is based on records of some 200 graduate students regarding overt sex activity and personal self-estimates. Among the topics considered are the effects of instruction on subsequent modes of adaptation; the relation of overt sex activity to the character of the general adjustment; the rôle of contact with prostitutes; the sanctions applied to the customary teachings in sex morals and the bearing of the present data upon them.

Calcium Deficiency as a Factor in Mental Instability. FLORENCE MATEER, Columbus, Ohio.

There are at least two possible attitudes in psychoclinical work, each fostered by the aims of the individual conducting such work. One may be interested primarily in obtaining a definite statement

of the mental condition and mental behavior of the subject. This is the attitude fostered by research organizations. But one may be just as properly concerned with such findings merely as a prerequisite to corrective and preventive care of the individual to modify that mental condition and behavior. This attitude is of necessity the one held by the worker who is attempting to function as a consulting psychologist to some one of our educational or social groups.

It is with this second attitude definitely established that the findings herein reported have been accumulated. They are but another step in the work reported in 1920 on the psychological indications of congenital syphilis.

There is a certain group of symptoms found in work with individuals of all ages which modify test findings and affect tremendously the economic value of the individual, but which are not permanent, since they are easily and quickly modified under combined medical and psychological care.

The symptoms are chiefly: lack of ability to concentrate for a normal length of time on any one matter, be it a school recitation or free play or a matter to be settled by an adult; hypersensitivity of sight and hearing, adding to ease of distraction; inferior motor control leading to highly erratic and tremulous reproductions of lines, etc. (not to be confused with the inaccurate reproductions of syphilitics); irregular responses on standard tests such as failure on the repetition of a certain span of digits but success on a harder series; behavior symptoms of great irritability, vexation spells, and, in older cases, emotional depression of marked type.

The history in these cases is very similar for all. A critical period of malnutrition or difficult nutrition, or deficient metabolism is always found.

Medical findings are corroborative. Where determination of the calcium content of the blood has been possible, the variations from the normal have been considerable.

Following upon proper medical handling and the use of calcium, codliver oil, parathyroid, or ultra-violet rays, or a combination of several of these, comes not only improved physical condition but definite change in the symptoms found on observation in the psychological laboratory. Play and study periods lengthen voluntarily. Mental test ratings show far less scattering and improvement in level which is greater than the time elapsing between tests would call

for. Irritability decreases. Sleep increases. A sense of humor often makes its first appearance. Speech peculiarities lessen.

There seems to be a definite improvement in the type of school work done as the mental test findings change.

The cases are not all clearcut as the condition is often found in connection with other factors producing instability. It often appears in very bright children and has seemingly no clearcut relation to children of any special intelligence rating. It is a type of mental function, not of mental level.

Children under medical care lose these characteristics. May we or may we not deduce a causal relationship between the calcium deficiency and the test variations?

A Study of Subject Matter and Motivation of Children's Dreams.

PHYLLIS BLANCHARD, All-Philadelphia Child Guidance Clinic.

Two hundred and thirty children under eighteen years of age were questioned, in the course of the clinical examinations, as to their dreams: 94.8 per cent reported recent dreams, but only 82.2 per cent were able to describe dreams; 12.6 per cent could not recall what they had dreamed about, and 5.2 per cent denied having any dreams. The 189 children who could recall their dream experiences, gave details of 315 dreams.

The 189 dreamers were classified according to life age, mental age and intelligence quotient. No significant trend as to frequency of dreaming for any particular life age, mental age or I. Q. appeared. The number of children is too small to base any general conclusions on these findings. It may be noted, however, that the I. Q. distribution of the group studied, with a range from 24 to 154, followed a fairly normal distribution curve.

Subject matter: In 25.4 per cent of the dreamers 15.3 per cent of the dreams were concerned with parents; 14.6 per cent of dreams in 24.3 per cent of dreamers were about animals; 13 per cent of dreams in 21.6 per cent of dreamers were those of terror or nightmares. Less than 10 per cent of dreams in less than 15 per cent of dreamers involved play, falling, robbers, death, relatives other than parents, opposite sex, supernatural beings, riches, fire. There was a large number of miscellaneous subjects. There was no particular

relationship between type of subject matter and life age or mental level.

Motivation: In 50.2 per cent of dreamers, 46.3 per cent of dreams were wish fulfillments; 40.6 per cent of dreams in 51.2 per cent of dreamers were motivated by fear; 0.5 per cent of dreams in 15.9 per cent of dreamers were an expression of mental conflict; 6.3 per cent of dreams in 9.5 per cent of dreamers reflected stories or movies; 5.7 per cent of dreams in 8.5 per cent of dreamers were an outcome of sex impulses or curiosity; 1.3 per cent of dreams in 2.1 per cent of dreamers presented the dreamer in a rôle compensating for inferiority feelings. In 8.9 per cent of dreams of 14.8 per cent of dreamers the motive was not ascertained. In considering these percentages, remember that one child may have more than one dream; one dream may have more than one motive.

This paper will include report of methods of studying motivation as well as results and a discussion of findings in comparison with psychoanalytic theories of the dream.

A Performance Test Outfit for the Traveling Clinic. GRACE H. KENT, Worcester State Hospital, Mass.

The out-patient service of the Worcester State Hospital holds mental hygiene clinics regularly in several different places, and frequently responds to an emergency call for an examination which must be made at the jail or court house. Non-language tests are essential, because there are many subjects whose knowledge of English is insufficient for language tests. This compact kit of testing apparatus, manufactured in our own shop, has been developed in response to a special need.

The Worcester Formboard Series holds the most important place in the outfit. The first two boards are useful for young children, but are not needed for older subjects. The third board of the series, with its four sets of blocks, offers a test that is discriminative for all subjects except those at the upper and lower extremes. The fourth board carries two sets of blocks, and is intended for subjects who are exceptionally strong in form perception.

The Kohs Block Design test, which in its original form requires too much time for general use in the clinic, has been modified to meet our needs. Designs of the same size as the blocks have been substituted for the smaller Kohs designs, and the series has been shortened and restandardized.

Two new series of picture puzzles are in use in our clinics, one series consisting of pictures cut into rectangular blocks and the other series having square pieces of equal size cut out from each picture.

A new symbol-digit test is being standardized as a test of accuracy rather than speed. The figures have been made large, in order to avoid causing unnecessary eye strain.

The outfit contains also certain well-known standard tests slightly modified in size. The Young Slot Maze has been made up in lighter weight material than that used for the regular model, and some of the Pintner-Paterson formboards have been reduced in size. These have not been re-standardized, and the norms are not strictly applicable to the modified forms, but they serve to give the examiner some idea of what may be expected from the subject. This is the principal use that is made of norms in our clinics, as exact ratings are considered to be misleading rather than illuminating.

A Standard Observation Pen for the Study of Infant Behavior.
ARNOLD GESELL, Yale University.

A device to facilitate systematic and controlled observation of infants and young children is described. The device is constructed with several interchangeable parts to permit multiple uses both for the same subject and for subjects of varying ages. The primary unit is a small enclosure or pen (2 ft. x 3 ft. x 4 ft.) with movable sides. This unit may be used as a semi-open enclosure, or as a cabinet with only one side open. The four upright posts are double fluted on each surface. These flutes serve as grooves in which adjustable panels may be placed. This makes possible the end to end and side to side addition to other units, after the manner of sectional furniture. By extension a simple maze may be constructed.

The primary performance pen is fitted for the application of adaptable "reaction screens." These screens are interchangeable. They carry the stimulating performance materials, or constitute the performance situations or obstacles and foils presented to the child. They may be presented singly or in series. They may be presented in varying planes, in relation to the subject; frontal, horizontal, oblique, overhead, and also underfoot by a cockpit arrangement. Barrier screens are used to provoke reactions to remote but accessible objects, and to test various forms of insight and capacity to use or to contrive implements. Specimen screens will be described or demonstrated by picture or model.

The purpose of the performance pen is to delimit and to define certain conditions for the observation of characteristic behavior. The suitability of a standard observation pen for both experimental and psychoclinical work is suggested.

WEDNESDAY, DECEMBER 30, 10:30 A.M.

PROGRAM B

ABNORMAL PSYCHOLOGY

An Explanation of the Acceptance of Suggestions During Hypnosis and of the Amnesia which Follows It. CURT ROSENOW, University of Kansas.

Acceptance of Suggestions: It will be shown that the responses of the subject to the suggestions of the hypnotizer arise out of the behavior of cooperating. The details of cooperation depend somewhat on the method used by the hypnotizer and vary with different subjects. At the beginning, the subject means to cooperate and follows instructions so far as he is able, (*e.g.*, he tries to go to sleep). While so engaged, he is aware of some of the unimportant verbal details of his behavior, such as "talking sleep" to himself, but is ignorant of the essential details. The acceptance of suggestions is shown to arise out of this ignorance. The subject is quite capable of becoming aware of these unknown details, but if his attention is called to them, the suggestions are no longer accepted.

Amnesia: It is assumed that it has been shown above that the responses to suggestions are intimately integrated with the behavior of cooperating. That is, the responses are details of cooperation. Meantime the unimportant verbal details of this behavior (mentioned above), which the individual was conscious of tend to drop out and the behavior tends to become almost purely a response to the hypnotizer. That is, the subject responds (socially) to the suggestions of the hypnotizer, but does not respond (socially) to his own responses. Accordingly he does not know the details of his behavior. And it is difficult (but not impossible) to remember what one has never known. An analysis is made of the various circumstances under which the subject does and does not remember the events of previous hypnoses, and it is shown that normal memory is "restored" in circumstances in which the subject is able to appreciate the mean-

ing of his responses to the hypnotizer, *i.e.*, he responds not only to the hypnotizer but responds (socially) to his own response. In this way the behavior ceases to be an integral part of the behavior of coöperating; it is no longer "dissociated."

The argument is developed on the basis of observations made with about 100 subjects. These observations differ from those reported by others only in the addition of a few details which were overlooked or else considered unimportant by other investigators.

Some Organic Aspects of Emotion. JOSEPHINE GLEASON, Vassar College.

In a study of some of the organic aspects of emotion, hysterical and psychasthenic subjects have been chosen, since their emotional behavior is accessible to observation. The paper is mainly a record of observations made on such individuals in clinic and laboratory during the past year. In hysterics, emotional experiences are likely to be frequent, may often be studied from start to finish, and may be partly controlled by suggestion. Fluoroscopic observations show that flashes of resentment, anxiety, dread, panics of fear in these individuals involve an immediate and vigorous activity of the stomach and sometimes of the intestines. In psychasthenic subjects, on the other hand, the fluoroscope seldom shows such spurts of gastric and intestinal activity; but it does often show their peristalsis to be already and continuously overactive. This is such a difference as we should expect to find on the physiological side to parallel the psychological one, already familiar enough; while the hysteric's thinking may pass for normal, though interrupted by accessions of emotion, the obsessional is continuously depressed and anxious. Accompanying this condition of peristalsis in psychasthenia, we find narrowed pupils, decreased reflexes of the skeletal muscles, slowed pulse, and blood pressure persistently low and inadequate to the adjustments called for by changes in bodily position.

Such responses are irrelevant to the individual's ordinary organic needs, and sometimes, of course, seriously interfere with them. Moreover they do not give themselves to any satisfying purposive interpretation: they are opposite in direction to those bodily changes in emotion (see Cannon) ascribed to sympathetic innervation, that have been evaluated as emergency measures to fortify the individual to meet real predicaments capably, and that may, indeed, only exaggerate the normal changes of the body in preparation for work. On

the other hand, the emotional conditions we describe may be comparable to fatigue in the normal person. The resemblance on the mental side has often been pointed out: the normal individual when tired knows the obsessing anxiety and depression of the psychasthenic. In the physiological descriptions of recent research on fatigue, some of the bodily changes we observe, still incomplete, are included.

Emotion and the Incidence of Disease. GEORGE M. STRATTON, University of California.

The present report is based upon psychological data from each of about seven hundred persons, and medical data from each of these same persons. A short time after being in a situation which for most persons evokes an emotional response either of anger or of fear, the individuals made a record, according to a prescribed form, of certain facts in their own reaction which permitted the writer to grade the individuals with respect to the degree and quality of their emotional behavior. The medical data were obtained by physicians during a medical examination, the person examined being required to state whether he had ever had any of a certain list of diseases.

Upon collating these reports, there appears in the group as a whole, to be some connection between the character of the response and the history of the individual with respect to disease. Those who have had any one of certain diseases do, as a group, show a somewhat more intense response to certain emotional stimuli than does the group of those who have not had any one of these diseases. And, as we might expect, the character of the disease which they have had is not unimportant for the emotional response.

The connection between disease and anger is clearer than that between disease and fear. The diseases here considered seem as a whole to go with neither raising nor lowering of fear. Further study should show whether particular diseases, however, may not go with increase, and others with decrease of fear.

As to explanation it is impossible as yet to determine whether the diseases here considered tend to leave behind them organic effects which involve a lasting reduction of the threshold of anger, or whether the constitution which offers less resistance to these diseases is apt to be more responsive to the stimuli of anger. These and other possibilities are not mutually exclusive, and several of them may find support from wider evidence. The indication that fear has a different relation to disease than has anger, should it be

verified, will stimulate a search into the deeper physiological difference between fear and anger. In any event we have here what may prove to be an additional and important method of approach to several problems regarding emotion.

The Nature of Motivated Behavior as Indicated by an Analysis of a Case of Compulsive Hand-Biting. ENGLISH BAGBY, University of North Carolina.

This paper will present the details of a case which is, in many ways, typical of the problems which are presented to a psychologist in charge of the mental health of a student body.

The patient exhibited diffusion, emotional transference, morbid worry, and compulsive hand-biting. As a first step in treatment, familiar devices were employed to frustrate, or inhibit, the hand-biting. The result was the immediate organization of a different compulsion. Subsequently, with analysis, it was discovered that the patient was facing a fear-provoking life situation to which he was unable to make a satisfactory adjustment. When this situation was eliminated, the whole complex of "symptoms" disappeared.

From the case, and from other considerations, the conclusion is drawn that the implicit features of emotional reactions are primary sources of motivation. The view of Kempf is rejected on the basis of the work of Cannon and Lashley. It is shown that emotional visceral tensions are comparable to the visceral condition of hunger and may operate as nonspecific "drives." It is contended that motivated habits are "tension-reducing devices." The specific form of a given habit is not referred to a specific autonomic posture (Kempf) but to the mechanisms of the central nervous system. Only the drive is referred to the smooth muscles.

WEDNESDAY, DECEMBER 30, 2:00 P.M.

PROGRAM A

MENTAL MEASUREMENT

Intelligence and General Psychology. A. S. EDWARDS, University of Georgia.

The term intelligence has been taken over from nonscientific usage; is it possible to define what we mean by it in such a way as to

make it acceptable as a scientific term in general psychology? Most of the definitions are in terms of technological interests or of teleological assumptions. Definitions in terms of success, of ability to learn, of ability to pass certain tests, are open to serious criticism although they may have certain justification from the point of view of technology. Attempt is made to define intelligence from the point of view of general psychology and to free it from teleological and technological implications.

The Intellect of Races. HAROLD RUGG, Columbia University.

In connection with the Philippine Educational Survey, January to May, 1925, 223,000 mental and educational tests were given to 32,000 Malays (grade I to first year University inclusive).

The tests were graduated in verbalness as follows: Otis S-A Intelligence Test; Thorndike College Entrance; hard paragraph reading; sentence meaning; word meaning; dictation and spelling; reasoning arithmetic; computation arithmetic; Pintner Non-Language Intelligence Test. There were two information tests (science and history—literature), a language usage test, and two individual oral reading tests—the Gates Word Test and the Gray Oral Reading Scale. Thirty-five hundred individual oral reading tests were given.

Eighty-seven language groups in the Philippines are assembled in eight major groups. Several thousand persons of each of these were tested.

Results can be understood best in light of hampering conditions of instruction in the Philippines:

(1) All instruction from first grade up in the Philippine schools is given in a foreign language (English); dissimilar in nearly every characteristic to the Malay tongues. (2) 29,000 Malay teachers average less than seventh grade education; only 300 American teachers. (3) Climatic conditions create difficulties of learning and a shortened school year. (4) Primitive agricultural environment of the Philippines versus urban, driving, linguistic environment of American towns and cities.

Results: Growth curves compare Filipinos with several hundred thousand American children grade two to grade eight inclusive. In performance on highly linguistic tests (Otis S-A Test; Thorndike Test and hard paragraph reading) Filipinos lag three and one-half years behind "Americans" of corresponding ages and grades. In performance on partially linguistic tests lag of Filipinos behind

American ranges between two and one-half years to six-tenths of a year. On completely nonverbal tests for intelligence or educational attainment, Filipino children age for age, and grade for grade approximate scores of American children. Filipinos exceed Americans in computational arithmetic. So-called "Intelligence" tests confirm findings from verbal and nonverbal educational tests. Conspicuous success in teaching silent reading in Bulacan province confirms conclusions as to educability of the Filipino. Minute analysis of the various factors *e.g.*, "age" does not modify these conclusions.

The Scoring of Group Intelligence Tests. R. PINTNER, Columbia University.

Are our group intelligence tests so "fool-proof," that little or no training in scoring is needed? Do we not assume that any teacher can score tests without previous practice? An experimental blank of the N. I. T. was prepared containing a great number of peculiar responses actually made by children. Several groups of students studying intelligence testing scored this blank. The presumably correct score for this experimental paper was 66. The range in scores reported by the students was from 3 to 85. The range in the number of errors in scoring, weighting and adding was from 0 to 40. Previous practice in scoring N. I. T. blanks seems to have little relationship to the number of errors made. Neither does previous practice in scoring any kind of intelligence test seem to reduce the number of errors on the experimental blank. Previous practice in scoring would seem to result in certain scoring habits which persist and are not modified by more practice. The reduction of errors in scoring can be accomplished by the checking of other students' papers and by the discussion of ambiguous responses made by the child. Evidence of this is shown by the reduction of errors which occurred after three months training in group intelligence testing. The students were retested at the end of this period with another experimental blank containing the same number of ambiguous responses as the first blank contained.

Many intelligence tests are not nearly so objective in scoring as the N. I. T., and the chances are that differences in scoring are much greater on such tests. We need to make the scoring of our tests as objective as possible, and at the same time secure as much training as we can for those who are giving intelligence tests.

The Relation of Speed to Intelligence. EDWIN G. BORING AND
CARROLL C. PRATT, Harvard University.

The investigations reported in this paper were designed to discover the relation of speed to intelligence as revealed by the performance under laboratory conditions of numerous tasks of varying degrees of difficulty and complexity. The subjects in the experiments were instructed to perform the various items of the tests as *quickly* and accurately as possible. The tasks included portions of the Army Alpha Examination and Otis Self-Administering Tests, number and sentence completions, sameness and opposites, analogies, syllogisms, proverbs, free and controlled associations, and simple muscular reactions. It was soon apparent from the initial results that there is a high correlation between score in an intelligence test, speed in an intelligence test, and speed in a simple reaction; that the "slow but accurate" subject has no advantage over his more accurate rival where time is an important consideration; and that speed of performance is a factor of great importance in individual differences in the intelligent act. Subsequent results tended to confirm these findings and showed further that an individual generally maintains the same relative rank order with respect to speed in all sorts of tasks ranging from the complexities of syllogisms and controlled associations to the simple act involved in muscular reactions.

These results would seem to have considerable significance in relations to the problem of intelligence. The total scores of intelligence tests for different individuals generally reveal significant time-differences. Upon analysis it turns out that these time-differences continue to appear in the same relative order in associative, cognitive, and simple reactions. Nowhere in such a series of reactions is it possible to localize the level of complexity at which the difference in time appears. It may be that the rôle of intelligence in psychology is comparable to that of "power" in mechanics, that is to say, work done in unit time. If a constant relation of intelligence to reaction-time of any sort can be finally established, we should, perhaps, be prepared to determine next the rate of conduction of the nervous impulse in individuals of different intelligence. At any rate we should have a precise and economical way of testing a fundamental and socially important individual difference.

The Mental Growth Curve and Adult Intelligence. L. L. THURSTONE, University of Chicago.

A new method of scaling mental test scores has been applied to the data of Burt on three thousand London school children, and on the data for the Otis self-administering tests. An absolute mental growth curve can then be constructed, which is independent of the distribution of difficulty of test items. By the same method the assumed normality of the distributions of test intelligence for successive ages is tested and found to be valid for the greater part of the age range. The method allows variation in dispersion of test intelligence for successive age groups.

The most significant finding is that adult test intelligence is not reached until the age of about nineteen or twenty, thus showing conclusively that the conventional fourteen or fifteen year level cannot be regarded as adult intelligence.

WEDNESDAY, DECEMBER 30, 3:00 P.M.

PROGRAM B

EDUCATIONAL PSYCHOLOGY

Psychology and an International Education Research Council and World Bureau of Education. G. W. A. LUCKEY, Washington, D. C.

Psychology is so interrelated with education that one cannot prosper without the concomitant advancement of the other. In essential interests the two fields are one and inseparable. Psychologists are in the truest sense educationists, and educationists must be trained psychologists in order to succeed.

The knowledge acquired and the truth discovered in both fields, though far from complete, are not being received and used by the people. At best education is a slow process. The inertia of ignorance, false ideas and crude habits of thinking is difficult to overcome. In a democracy where numbers count, the inertia of ignorance may be felt in unwise legislation and cruel laws, tending even more to hold back progress.

Psychology and education are universal in application. The essential needs of humanity are for the most part common. There are no demarking boundary lines in the search for truth. The feel-

ing of comradeship and the spirit of fraternity are all but universal among students, scientists, psychologists and educationists.

There is at present sane and wholesome intellectual striving of many peoples for the establishment of an International Education Research Council and World Bureau of Education to gather, collate, digest, conserve and distribute accurate facts, information, statistics and true condition of education in all countries. Since psychologists and educationists are alike affected by all movements tending to better the condition of mankind, they should take advantage of the opportunity of directing this world hunger for better things to full fruition. Psychology in all phases would be benefited by such a world bureau and research council; but especially, clinical psychology which has proven so valuable to education, child culture, and human welfare.

Most governments are now earnestly seeking for acceptable plans for closer coöperation in international affairs. An increasing number of scholars and statesmen believe that the foundation and key of any successful plan of international comity and mutual coöperation must rest primarily on the education systems of the world. It is an important duty of psychologists and educationists, at this critical juncture, to prepare such a plan and to render all possible aid in bringing it clearly to the attention of the conditioning authorities.

If ever international peace, amity, prosperity, and genuine happiness become established facts of humanity, their sustaining roots will be found deeply imbedded in national systems of right education, affecting the lives of all the people, surrounded by protective environments of good will and intelligently coöperative governments.

Three Simple Experiments in the Teaching of Required Classes in Psychology. S. L. PRESSEY, Ohio State University.

The paper reports three simple investigations which are part of an extensive program of research regarding problems of content and instructional methods in courses in psychology.

The first study had to do with the use of a project-laboratory method in a large section (71 students) in elementary psychology. The class met five times a week. On Monday the projects for the week were outlined—though nothing as to the probable results of the experiments was indicated. For the following three days this whole big class was handled as a very informal, laboratory section. On Friday the results of the experimenting were gathered together

and clarified in an hour of informal discussion. The value of the whole procedure was checked in various ways—by comparison with examination papers from sections taught by the lecture method, by unsigned comments of students, by "holding power" (number of students who went on to further courses in the department, from this as compared with other sections).

As a result of a study published about a year ago (*School and Society*) it was decided to double the reading load of the required course in educational psychology. This program has now been in operation a year, with about 700 students. The question is as to the worth of this departure. The problem was studied so far as possible from the point of view of both instructor and student. Particularly interesting was the question of holding power already mentioned; the heavy load might be expected to frighten students away from further courses in psychology—or, it might, perhaps, interest them more.

Presumably one of the first things a first course in psychology might do for a student would be to help him in his methods of study. However, careful analysis of books on study methods showed them to be astoundingly *a priori*, impractical, and not in agreement among themselves. The questions were: What methods of study actually to "deliver the goods"? and What help do college students in first courses in psychology need? To deal with these questions an elaborate inquiry form regarding methods of study was prepared, and given to some 300 students in elementary and educational psychology. The marks made by the students during the preceding two quarters were also obtained. The fifty students averaging the best marks and fifty averaging the poorest marks, were then contrasted as to study methods, to determine if possible "how the good students did it." Results were checked by individual interviews with twenty-five good and twenty-five poor students.

Study Habits of High School Pupils as Shown by Close Observation of Contrasted Groups. PERCIVAL M. SYMONDS, Columbia University.

This paper presents the results of about 30 hours' close observation of the study and recitation conduct of 10 boys in the third form (ninth grade) of the Horace Mann School for Boys. Five boys were selected as being superior in studiousness and five boys were selected as being inferior in studiousness with the factor of intelli-

gence eliminated. The differences noted in the observation are discussed under the headings (1) clerical abilities, (2) reading abilities, (3) ability with materials, (4) problem solving, (5) habits, (6) attention, (7) motivation, (8) memorizing. In several instances objective tests were given to compare with the observation. Among the clerical abilities both the observation and tests showed the studious group to be superior in ability to file alphabetically, in copying numbers, and in the fundamentals of arithmetic where there was quick shifting from one process to another. The studious group was superior in speed of reading and in some of the features of problem solving such as trying many possibilities when one did not prove successful, checking results, and correcting mistakes. Specific habits in which there was a difference between the groups are: being unwilling to permit questions to go unanswered, working overtime, anticipating the answer to questions, having work done on time, being industrious during study period, doing things for one's self rather than having things done for him, planning work, enjoying doing new things. Habits of attention seem of particular importance. No noticeable differences were observed of the habits of ignoring distracting stimuli or of working continuously. But the studious group showed decided superiority in ability to carry on two lines of activity at the same time which involved rapid shifting of attention. Motivation is known to account for some of the differences between the groups. The boys rarely memorized in a formal way. More important than efficiency in memorizing would seem to be knowing *what* and *when* to memorize.

Data were collected from published questionnaire studies to show that many of the rules given in the "How to Study" manuals emphasized habits or abilities that are of little importance in the efficiency of study required in school.

The Relation of Rate to Quality of Work. PAUL J. KRUSE, Cornell University.

I. *The problem:* In the case of children of grades 6, 7, 8, working under school-room conditions—(1) Do those who take much time to complete a given task tend to do well in the task; or the reverse? (2) Do those who go far in a given task in a limited amount of time tend to do well; or the reverse?

II. *Data:* (1) Returns from testing approximately 600 pupils of the 6th, 7th and 8th grades of a large city school system. Subject-matter and psychological tests. All pupils individually tested. No

time limit. (2) Returns from testing approximately 200 pupils of these grades in a small city school system. Subject-matter tests only. One group without time limit. Other group with time limit.

III. *Treatment of data:* (1) No time limit returns: Correlation between (a) Score and score divided by time; (b) score and time. (2) Time limit returns: Correlation between (a) Number of items of test attempted and number correct divided by number attempted. (3) Returns treated by grades and teachers.

Educational Achievement of Children with Personality and Behavior Difficulties. RICHARD H. PAYNTER, JR.

This paper will present a study of the educational achievement of 170 children (with intelligence quotients of 80 or above) having personality and behavior difficulties. The group includes 119 boys and 51 girls. Each child has had a thorough study in the Child Guidance Clinic. The study consists of complete social history and detailed medical, psychological, educational and psychiatric examinations. The data from all these sources are utilized in making the following studies.

1. *Intelligence and educational achievement.* Report of the intelligence quotient, educational quotient, and accomplishment range for the boys and girls. Lower and upper limits are: I.Q.'s for boys 80-154, for girls 80-153; E.Q.'s for boys 62-172, for girls 77-159; A.R.'s for boys 70-121, for girls 75-128. The average and median I.Q.'s, E.Q.'s and A.R.'s are also computed for both boys and girls.

2. *Comparison of educational achievement with that of unselected group.* We have data as to the A.R. distribution and median A.R. of 4,325 pupils in the Los Angeles public schools. Since our children are from the same school system, this serves as a control group on these points.

3. *Personality difficulties and educational achievement.* Our group of children presents chiefly the following personality difficulties: emotional conflicts, hyperactivity, inadequacy, functional nervous disorder, feelings of inferiority, emotional makeup, emotional instability, adolescent instability, seclusiveness, etc. A study of these different types of personality in relation to the intelligence level and educational achievement is presented.

4. *Behavior difficulties and educational achievement.* The most common behavior difficulties of the children in the group are: steal-

etc. A study is made of the various types of behavior in relation to ing, running away, lying, sex misconduct, truancy, disobedience, temper tantrums, fighting, and habits such as masturbation, enuresis, intelligence level and educational achievement.

5. *Relation of social conditions to intelligence level and educational achievement.* This includes data on training and discipline, heredity, broken homes, recreation, companions, domestic relations of parents, economic condition, etc.

6. *Relation between physical condition and intelligence level and educational achievement.* The data includes nose and throat conditions, vision and hearing defects, endocrine symptomatology, dental defects, cardiac and pulmonary conditions, nutrition, posture, neurological findings.

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NOTES AND NEWS

PROFESSOR JAMES H. LEUBA of Bryn Mawr College has been invited and has consented to take part in a symposium on the psychology of religion at the Eighth International Congress of Psychology to be held in Holland in September of this year.

THE twenty-fifth anniversary of Professor Edward L. Thorndike's connection with Teachers College, Columbia University, was celebrated on Friday, February 19, with a dinner at which about two hundred and fifty of Professor Thorndike's colleagues, former students and friends were present.

THE Council of the University of Paris has appointed M. Delacroix, professor of psychology in the faculty of letters, to be the Zaharoff lecturer at Oxford University for the ensuing academic year.

PROFESSOR M. J. ZIGLER of Wellesley College has been appointed to the staff in psychology at Ohio State University for the first six weeks of the summer quarter.

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